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A Key to the Labiatae of China.

BY

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Formerly Superintendent of the Botanical and Forestry Department, Hongkong, China.

THE following keys to the genera and species of the Labiate plants of China proper, and the enumeration of the species which accompanies them, were drawn up from the splendid mass of material assembled at Kew from the chief herbaria of the Old World, under the circumstances mentioned in my preliminary paper in this periodical (xxxvii, 154), published two years ago. The characters and localities mentioned are taken from the actual specimens seen, and it has been possible to compare most of them with their original types. The only large collection consulted since the above paper was written has been the Labiates of the Hongkong herbarium, kindly entrusted to me by my friend and successor, Mr. W. J. Tutcher, Superintendent of the Botanical and Forestry Department of that important Crown Colony, which Sir Joseph Hooker once referred to in an official memorandum as the key to the botanical position with respect to China.

The keys have throughout been constructed on practical lines, and are based as far as possible on characters easily observable without minute examination. The enumeration on the same principle contains references only to the clearest and most readily accessible descriptions of the genera and species. These are followed in each case by the colour of the flowers, months of flowering, and natural habitat whenever the information has been obtained. A list of the specimens seen from each province follows, the collectors' numbers being added for the convenience of students in herbaria not annotated by the writer. A classified list of determinations of plants numbered by the different collectors is appended to the paper.

My object in selecting the *Labiatae* out of all the families represented in the Chinese flora to examine at this time was to test whether botanical exploration had proceeded far enough to make possible the study of the phytogeographical division of the empire. For these attractive and easily preserved plants

[Notes, R.B.G., Edin., No. XXVIII, May 1915.]

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are probably better represented in our herbaria than most others. The writer is reluctantly forced to the conclusion that our present knowledge does not warrant the drawing up of any such scheme of plant areas for China, and the following suggestions are merely an indication of some obvious distribution lines which appeared in the preparation of the work. The apparent distribution along lines is doubtless due to the fact that, compared with the great bulk of the empire, the areas collected in are but isolated points, and the attempt to trace out an area of distribution results in lines connecting them.

1. Commencing then from Yunnan, the south-west corner of China, and probably the richest province in Labiates, many species (such as *Leucas mollissima* and *Teucrium japonicum*) extend due eastwards along the dry hills of S. China as far as Hainan and Kwangtung and northwards as far as E. Szechuen and Hupeh through Kweichow. *Teucrium quadrifarium* and *Stachys kouyangensis*, starting from the same province, pursue a north-eastern line, reaching as far as the Yangtze in lower situations, while such species as *Plectranthus ternifolius*, though common and characteristic in the southern uplands, extend no further north than Kweichow. *Elsholtzia communis* and *E. polystachya*, avoiding on the other hand the eastern part of this area, seem to follow the dry grassy mountain pastures through the centre of China as far as the middle of the northern boundaries in Shensi and Chili.

2. While the above species follow lines radiating out from Yunnan through the half quadrant east to north-east, many others, such as *Orthosiphon rubicundus*, *Plectranthus Coetsa*, *Salvia hians*, and *Nepeta lamiopsis*, are found to extend from Yunnan due north along the bare stony pastures which flank the lofty mountain ranges of Tibet as far as Ta-chien-lu in E. Szechuen. *Dracocephalum tanguticum* and *D. heterophyllum* reach still further north on the same line, running down to the lesser altitudes of Kansu; while the peculiar group of *Elsholtzia* species, with woolly flower-spikes, is represented by a succession of forms along the same range (viz. *E. ianthina* in Kansu, *E. calycocarpa* and *E. eriostachya* further south). All the species of north and south extension show, as usual, increasing altitude with decreasing latitude.

3. Coming now to denizens of damp and shady places which radiate from the south-west, *Pogostemon fraternus* and *P. glaber*, *Scutellaria discolor*, *Craniotome versicolor*, and *Leucosceptrum canum* reach from India only as far as the shady forests of S. Yunnan; *Dysophylla verticillata* and *D. auricularia* extend thence due eastwards to Kwangtung, while *D. linearis* reaches north-eastwards to Kweichow. *Scutellaria rivularis* has in the

same region a much wider range, adorning with its intensely blue spikes the margins of springs and rivulets as far north as the Yangtze and as far east as the damp upland woods of Fukien.

4. Transferring our attention now to the opposite or north-east corner of China, *Plectranthus glaucoides*, Thyme (*Thymus Serpyllum*), *Scutellaria scordifolia*, and *S. viscidula* are known in the empire only from Shantung and Chili, the north-easternmost provinces. *Plectranthus amethystoides*, *Mosla dianthera*, and *M. lanceolata* are examples of the numerous species extending down the whole east coast on the dry grassy ranges so well known to mariners of the coastwise routes. *Salvia miltiorrhiza*, on the other hand, though abundant in the northern coastal provinces, does not reach further south than Chekiang and extends westwards to Hupeh.

5. *Ajuga ciliata* follows a diagonal south-west course from the north-east as far as central China, while such species as *Nepeta Cataria* continue the same south-west line across the whole country as far as Yunnan.

6. A few maritime species such as *Hyptis suaveolens* follow the salt marshes from the south as far as Fukien, but in this family, as in the rest of the Chinese flora, few species are restricted to saline regions.

7. *Scutellaria macrantha*, one of the finest Labiate plants of the flora, is confined, like a few other species, to the line of northern provinces.

8. The centre of China, viz. Hupeh and its neighbourhood, is, so far as records show, the home of an unusually large number of endemic species, such as *Salvia Maximowicziana* and *Phlomis gracilis*; but it must be remembered that the region has become better known than almost any other in consequence of the inclusion of Henry's vast collections there in the material elaborated by Hemsley in his Enumeration of the plants of China in the Linnean Journal.

9. As regards endemic elements in the various provinces there is doubtless everywhere a comparatively large proportion of species exclusively confined to each of the numerous isolated and peculiar tracts which occur throughout the country, and every new mountain which is botanically explored yields its quota of novelties. In the writer's own experience, a month's sojourn on the central range of Fukien contributed some 30–40 new species to the flora; while three days on the sacred mountain, Hong Wong Shan, near Swatow, has enriched our knowledge with many beautiful species before unknown. Yunnan has a very large list of exclusive species, having been the hunting-ground of three most energetic collectors whose finds were examined and described by, or for, three of the most efficient

botanical establishments in the world. The centre of the province was known first from the collections of Delavay and the writings of Franchet at the Jardin des Plantes, Paris; the south from Henry's collections and the labours of Kew botanists, still in progress; the north from Forrest's explorations and the publications of the Edinburgh Botanic Garden. The romantic and adventurous journeys of the latter collector will, it is to be hoped, be described some day in book form, and they might make one of the most attractive narratives of botanical enterprise in China. Next to Yunnan, perhaps Szechuen is the best known from the writings and collections of Wilson, and especially from the Plantae Wilsonianae published by the Arnold Arboretum. Kwangtung, though less fortunate in its failure to attract horticultural collectors and in the absence of very large exhaustive collections in European herbaria, has had many earnest botanical students from the earliest times of European immigration. The collections of Hance and Ford, and in more recent times Matthew, Tutcher, and the writer, have been examined and described at different times and in many publications. But the province has the unique advantage of a complete descriptive flora (*Flora of Kwangtung*, by Dunn and Tutcher), and of a botanical establishment and fine herbarium at Hongkong. These three provinces have already been proved to have large endemic lists, and these are not likely to be greatly reduced. In a smaller degree the same may be said of the less explored regions; and when the mapping out of botanical regions comes to be undertaken, the existence of many specialised internal areas will doubtless be recognised.

KEY TO GENERA.

1. Lower or horizontal lip or (when subregular) lobe of corolla entire . . . . . . 2.
Lower or the erect lip 3-lobed . . . . . 26.

2. Upper tooth of calyx very broad . . . . . 3.
Upper tooth little, if any, broader than others . . 13.

3. Upper tooth of calyx decurrent on tube . . . 10.
Upper tooth not decurrent . . . . . . 4.

4. Corolla spurred . . . . . 8. *Plectranthus*.
Corolla not spurred nor gibbous at base . . . 5.

5. Flowers in compact spikes or heads . . . 6.
Inflorescence loose . . . . 8.

6. Flowers in globular heads . . . 5. *Acrocephalus*.
Flowers in oblong or linear spikes . . . . 7.

7.	Leaves ovate serrate	10. *Anisochilus.*
	Leaves oblong crenate	4. *Nosema.*
8.	Calyx cylindric pitted	9.
	Calyx campanulate	12.
9.	Fruiting calyx 3–4 times as long as broad	2. *Geniosporum.*
	Fruiting calyx twice as long as broad	3. *Mesona.*
10.	Calyx lobes shut together in fruit	31. *Scutellaria.*
	Calyx campanulate in fruit	11.
11.	Corolla tube distinctly exserted	7. *Orthosiphon.*
	Corolla tube hardly exserted	1. *Ocimum.*
12.	Corolla lobes nearly equal	6. *Moschosma.*
	Lower lobe longer, deflexed	9. *Coleus.*
13.	Corolla gibbous at base or distinctly 2-lipped or inflorescence loose	17.
	Corolla tube cylindric, hardly 2-lipped; inflorescence compact	14.
14.	Corolla distinctly 4-lobed	15.
	Corolla 5-lobed	16.
15.	Leaves pinnatifid	50. *Amethystea.*
	Leaves not deeply lobed	19.
16.	Stamens 2	19. *Mosla.*
	Stamens 4	18. *Perilla.*
17.	Calyx teeth setaceous	11. *Hyptis.*
	Calyx teeth triangular or lanceolate	18.
18.	Corolla bilabiate; stamens declinate	8. *Plectranthus.*
	Corolla lobes spread into a flat limb; stamens divaricate	17. *Hancea.*
19.	Filaments bearded at centre	20.
	Filaments glabrous	22.
20.	3 or more leaves whorled together	13. *Dysophylla.*
	Leaves opposite in pairs	21.
21.	Leaves sessile or subsessile	13. *Dysophylla.*
	Leaves long-stalked	12. *Pogostemon.*
22.	Calyx divided nearly to base	25.
	Calyx shortly lobed	23.
23.	Flowers in dense axillary whorls	24.
	Flowers in terminal or axillary often dense racemes	15. *Elsholtzia.*
24.	Anthers 4; calyx teeth lanceolate	20. *Mentha.*
	Anthers 2; calyx teeth subulate	21. *Lycopus.*
25.	Calyx plumose, pappus-like	14. *Colebrookia.*
	Calyx subglabrous	16. *Keiskia.*

26.	Upper lip of corolla much shorter than the lower, bifid or 0	27.
	Upper lip as long as, or longer than, the lower, entire	31.
27.	Flowers minute, in crowded cymes	35. *Craniotome.*
	Flowers of moderate size, spiked or racemed	28.
28.	Stamens included	33. *Chelonopsis.*
	Stamens exserted	29.
29.	Flowers in dense woolly spikes	52. *Leucosceptrum.*
	Flowers in racemes	30.
30.	Upper lip of corolla entire or emarginate	53. *Ajuga.*
	Upper lobes of corolla 2 or 4, equal	51. *Teucrium.*
31.	Flowers in small corymbed spikes	22. *Origanum.*
	Inflorescence not corymbose	32.
32.	Leaves small entire	33.
	Leaves moderate or large, crenate or serrate	34.
33.	Calyx bilabiate	23. *Thymus.*
	Calyx teeth equal	24. *Micromeria.*
34.	Stamens 2, anthers on long-equitant connective	27. *Salvia.*
	Stamens 4	35.
35.	Calyx 13–15-nerved	36.
	Calyx 5–10-nerved	40.
36.	Calyx bilabiate	37.
	Calyx teeth equal and sinuses equal	39.
37.	Bracts bristle-like; corolla tube hardly exserted	25. *Calamintha.*
	Bracts broader or corolla tube far exserted	38.
38.	Calyx with 5 distinct veins, others obscure	26. *Melissa.*
	Nerves of calyx 15 distinct	30. *Dracocephalum.**
39.	Flowers in dense terminal spikes without bracts	28. *Lophanthus.*
	Flowers in loose inflorescences or with conspicuous bracts	29. *Nepeta.*
40.	Stamens included in corolla tube	41.
	Stamens exserted	42.
41.	Leaves inciso-lobate	34. *Marrubium.*
	Leaves crenate or serrate	33. *Chelonopsis.*
42.	Upper lobe of calyx broad, winged	43.
	Calyx lobes subequal	44.

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* The division of *Dracocephalum* from *Nepeta* was recognised by Linnaeus and most subsequent botanists as depending upon the bilabiate form of the calyx in the former, the latter having 5 equal calyx teeth. The irregularity of the bilabiate calyx of *Dracocephalum* consists in either (1) having one broad upper lobe and 4 small narrow ones below, or (2) having 3 teeth united nearly to the top, the remaining 2 free from each other and from the 3 united ones.

43. Flowers in a single terminal spike ; filaments bifid at top . . . . 32. *Prunella.*
Flowers in panicled racemes . . . 42. *Paralamium.*

44. Calyx with 10 equal teeth . . . . 44. *Leucas.*
Calyx 5-toothed with occasionally 5 intermediate smaller ones . . . . . 45.

45. Style equally bifid . . . . . . 46.
Style entire, or lobes very unequal . . . . 55.

46. Corolla tube saccate on lower side . . 49. *Eurysolen.*
Corolla tube cylindric or equally dilated above . . . . 47.

47. Nutlets fleshy when ripe . . . 48. *Gomphostemma.*
Nutlets dry when ripe . . . . . 48.

48. Shrubs with scarlet flowers . . . 37. *Colquhounia.*
Herbs . . . . 49.

49. Nutlets rounded at top . . . . . 50.
Nutlets truncate, often with a raised rim at top . . 53.

50. Leaves trifid or calyx teeth spinose . . 39. *Galeopsis.*
Leaves entire or lobed, teeth not spiny . . . 51.

51. Stamens longer than corolla . . 36. *Anisomeles.*
Stamens included under upper lip . . . . 52.

52. Nutlets supported on conspicuous gynophore 43. *Loxocalyx.*
Nutlets sessile . . . . . 38. *Stachys.*

53. Plant shaggy with long silky hairs . . 46. *Eriophyton.*
Plant without long silky hairs . . . . 54.

54. Leaves not lobed ; calyx teeth soft . . 41. *Lamium.*
Leaves pinnatifid or calyx teeth spinous . . 40. *Leonurus.*

55. Flowers in dense whorls . . . 45. *Phlomis.*
Flowers in stalked cymes . . . 47. *Microtoena.*

1. **Ocimum**, Linn. ; Fl. Brit. Ind. iv, 607.

Leaves softly hairy, regularly closely crenate ; calyces thickly glandular with few soft hairs . . . . . . 1. *O. sanctum*, L.
Leaves nearly glabrous, nearly entire ; calyces with few glands, setose . . . 2. *O. basilicum*, L.

1. **Ocimum sanctum,** Linn. ; Fl. Brit. Ind. iv, 609.
Flowers white.
SZECHUEN : O-mi-shan, 1899, *Hugh.*
HAINAN : *Henry*, 8709.

2. **Ocimum basilicum,** Linn. ; Fl. Brit. Ind. iv, 608.
Flowers purple, August. Woods.
CHILI : Pekin, *Bretschneider.*
CHEKIANG : *Hickin.*

YUNNAN: Mengtze, *Henry*, 11,375; *Ducloux*, 512.
KIANGSU: Shanghai, *Faber*.
YUNNAN: Yunnan-sen, *Maire*, 24; Mengtze, 5000 ft., *Henry*, 11,375; *Ducloux*, 512.
KWANGTUNG: *Ford*, 140; Swatow, Wukingfu, *Dalziel*.

2. **Geniosporum,** Wall.; Fl. Brit. Ind. iv, 609.

Geniosporum strobiliferum, Wall.; Fl. Brit. Ind. iv, 610.
Flowers white with purple veins. Dry forests.
YUNNAN: Pu-erh, *Henry*, 13,393.

3. **Mesona,** Bl.; Fl. Brit. Ind. iv, 611.

Leaves obtuse at apex, acute or acuminate at the base, glabrous	1. *chinensis*.
Leaves acute at apex, obtuse at base, thinly hairy beneath	2. *procumbens*.

1. **Mesona chinensis,** Benth.; Fl. Hongk. 274.
Flowers September.
KWANGTUNG: Thai-yong, 2000 ft., Swatow, *Dalziel*; Saywan, Hongkong, *Wilford*, 216; Hongkong, *Harland*, 675.

2. **Mesona procumbens,** Hemsl. in Ann. Bot. ix (1895), 155, t. 7.
Flowers blue, April to November.
KWANGTUNG: Phoenix Mt. near Swatow, *Dunn*; Hongkong New Territory, cult. *Tutcher*.

4. **Nosema,** Prain in Journ. As. Soc. Beng. lxxiii, 20.

Nosema prunelloides, Prain.
Mesona prunelloides, Hemsl. in Journ. Linn. Soc. xxvi, 267.
Flowers pink, blue, or white, April to October. Rocky slopes.
HAINAN: *Katsumata*; Shun Cheong, *Ford*, 457; Pakhoi, *Playfair*.

5. **Acrocephalus,** Benth.; Fl. Brit. Ind. iv, 611.

Herb	1. *capitatus*.
Shrub	2. *fruticosus*.

1. **Acrocephalus capitatus,** Benth.; Fl. Brit. Ind. iv, 611.
Flowers white or pale purple.
YUNNAN: Szemao, *Henry*, 12,610.

2. **Acrocephalus fruticosus,** Dunn in Notes Bot. Gard. Edin. xxxvii, 154.
Flowers September.
YUNNAN: Valley of Yangtze below Pung-tzu-la at 9000 ft., *Forrest*, 582.

6. **Moschosma**, Reichb. ; Fl. Brit. Ind. iv, 612.

Moschosma polystachyum, Benth. ; Fl. Brit. Ind. iv, 612.

Flowers flesh-coloured.

HAINAN : *Henry*, 8181.

7. **Orthosiphon**, Benth. ; Fl. Brit. Ind. iv, 612.

1.	Corolla longer than the stamens	2.
	Corolla much shorter than the stamens	3.
2.	Corolla slender ; leaves suddenly narrowed into slender petioles	1. *O. marmoritis.*
	Corolla broad ; leaves gradually narrowed below, sessile or subsessile	2. *O. rubicundus.*
3.	Corolla more than 2 cm. long	3. *O. stamineus.*
	Corolla less than 1.5 cm. long	4. *O. debilis.*

1. **Orthosiphon marmoritis,** Dunn in Notes Bot. Gard. Edin. xxxvii, 154.

Plectranthus marmoritis, Hance in Journ. Bot. 1874, 53.

Flowers white, July and August. On rocks in shady places.

KWANGTUNG : *Ford*, 146 (partly) ; West River, *Sampson*, 18th July 1872 ; Lungchow, *Morse*, 531.

2. **Orthosiphon rubicundus,** Benth. ; Fl. Brit. Ind. iv, 614.

Coleus wulfenioides, Diels in Notes Bot. Gard. Edin. xxv, 231.

Flowers pink, red, or purple, May to September. Barren grassy slopes and pine woods.

SZECHUEN : Tung valley, 4500 ft., *Wilson*, 4349.

YUNNAN : *Ducloux*, 17 ; Yunnan-sen, *Maire*, 219, 1758, 2004, 2181, 2693 ; common in pine woods on the sides of the Hoching and Lichiang ranges at 8000–9000 ft., *Forrest*, 126 ; south end of Lang-kong valley, *Forrest*, 5584 ; Mengtze, 5000 ft., *Henry*, 9800, *Hancock*, 66.

HAINAN : Sam-shan-sze, *Dunn's Chinese collector.*

3. **Orthosiphon stamineus,** Benth. ; Fl. Brit. Ind. iv, 615.

Flowers blue.

HAINAN : La-tai-si, *Ford*, 460 ; *Henry*, 8533 ; Tingan (Katsumata) *Hongkong Herb.* 5556.

4. **Orthosiphon debilis,** Hemsl. in Journ. Linn. Soc. xxvi, 267.

Plectranthus cardiaphyllus, Hemsl. l.c. 269.

Flowers white.

SZECHUEN : S. Wushan, 7500 ft., *Henry*, 5770, *Wilson*, 4348, 4348A.

HUPEH : Chien-shih, *Henry*, 5770A, 6993, 6050.

8. **Plectranthus**, L'Herit.; Fl. Brit. Ind. iv, 616.

1.	Leaves whorled in threes	1. *ternifolius*.
	Leaves opposite	2.
2.	Calyx with 2 nearly entire lips; corolla spurred	49.
	Calyx with 5 nearly equal teeth	3.
3.	Corolla tube 4–6 times as long as the calyx	4.
	Corolla tube not more than twice as long as the calyx	9.
4.	Flowers racemose	5.
	Flowers paniculate	6.
5.	Upper lip of the corolla about equal to the lower	2. *macranthus*.
	Upper lip of the corolla 3 times as long as the lower	3. *Prainianus*.
6.	Leaves ovate	7.
	Leaves linear-oblong	4. *angustifolius*.
7.	Corolla widely gibbous at the base	5. *Bulleyanus*.
	Corolla cylindric at the base	8.
8.	Leaves blunt, subsessile	6. *Stracheyi*.
	Leaves acute, stalked	7. *striatus*.
9.	Leaves distinctly stalked	10.
	Leaves sessile or subsessile	30.
10.	Leaves stellately tomentose	11.
	Leaves without stellate tomentum	13.
11.	Leaves rugose	12.
	Leaves flat	8. *discolor*.
12.	Teeth of fruiting calyx $\frac{1}{5}$ of its tube	9. *leucophyllus*.
	Tube of fruiting calyx equal to the teeth	10. *rugosus*.
13.	Leaves cordate	11. *sculponiatus*.
	Leaves not cordate	14.
14.	Flowers racemose	12. *excisus* (var. *racemosus*).
	Flowers paniculate or in axillary cymes	15.
15.	Calyx teeth, at least in fruit, 4 times the teeth	16.
	Calyx tube not more than twice the teeth	22.
16.	Corolla 9–10 mm. long; seeds oblong	13. *rubescens*.*
	Corolla 5–6 mm. long	17.
17.	Corolla widely gibbous at the base	14. *phyllopodus*.
	Corolla nearly or quite cylindric at the base	18.

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* *P. rubescens*, Hemsl., is a glabrous-leaved form of a species which includes scabrous- and densely pubescent-leaved plants connected together by various intermediates. The shape of the corolla, calyx, and leaves, and the red colour of the plant are uniform in all. *P. Coetsa* differs in its large branching habit, its calyx [illegible] mm. not 5 mm. long, and its calyx teeth $\frac{1}{2}$ not $\frac{1}{4}$ of the tube.

18. Corolla tube 3–4 times longer than the calyx; calyx 1 mm. broad and long, calyx teeth blunt . . . . . 7. *striatus*.
Corolla tube not more than twice as long as the calyx . . . . . . 19.

19. Leaves acute or acuminate . . . . . . 20.
Leaves blunt . . . . . 15. *Henryi*.

20. Inflorescence woolly . . . . 16. *eriocalyx*.
Inflorescence not woolly . . . . . 21.

21. Leaves grey-pubescent beneath . . . 17. *Cavaleriei*.
Leaves nearly glabrous beneath . . 18. *glaucocalyx*.

22. Corolla widely gibbous at base . . . . 23.
Corolla cylindric at base or nearly so . . . 28.

23. Corolla 5–6 mm. long . . . . 19. *Coetsa*.
Corolla 7–15 mm. long; leaves glabrous . . . 24.

24. Leaves obtuse or acuminate; flowers in narrow panicles or in axillary cymes . . . 25.
Leaves cuspidate; flowers in spreading panicles . . . . . 12. *excisus*.

25. Leaves shortly acuminate . . . . . 26.
Leaves obtuse . . . . . . 27.

26. Corolla 7 mm. long . . . . 20. *Rosthornii*.
Corolla 1.1 cm. long . . . . 21. *ricinispermus*.

27. Corolla 7–9 mm. long . . . 22. *adenanthus*.
Corolla 1.2–1.4 cm. long . . . . 23. *irroratus*.*

28. Leaves lanceolate, acute, cuneate at the base . . . . 29.
Leaves ovate, abruptly acuminate at the base . . . . . . 15. *Henryi*.

29. Fruiting calyx teeth short, triangular . 18. *glaucocalyx*.
Fruiting calyx teeth long, acute . 24. *nervosus*.

30. Corolla widely gibbous at the base . . . . 31.
Corolla cylindric at base or nearly so . . . 46.

31. Flowers 1.2–1.5 cm. long . . . . . 32.
Flowers 5–10 mm. long . . . . 34.

32. Leaves linear-oblong . . . 4. *angustifolius*.
Leaves ovate . . . . . . 33.

33. Flowers in axillary cymes; leaves obtuse . . 23. *irroratus*.
Flowers in loose panicles; leaves acute . . 25. *Forrestii*.

34. Inflorescence woolly or tomentose . . . 16. *eriocalyx*.
Inflorescence glabrous or pubescent . . . 35.

35. Flowers in racemes . . . 12. *excisus* (var. *racemosus*).
Flowers in panicles or cymes . . . . . 36.

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* *P. irroratus*, Diels, in cultivation has larger leaves and fewer flowers.

36.	Flowers 8–10 mm. long	37.
	Flowers 5–6 mm. long	26. *amethystoides.*
37.	Leaves acuminate or acute	38.
	Leaves obtuse	42.
38.	Flowers in axillary cymes	39.
	Flowers in panicles	40.
39.	Shrub ; leaves finely serrate	27. *pleiophyllus.*
	Large herb ; leaves coarsely serrate, acuminate	28. *grosseserratus.*
40.	Bracts serrate	41.
	Bracts sub-entire	26. *amethystoides.*
41.	Whole plant pubescent ; panicle spreading	29. *megathyrsus.*
	Plant subglabrous ; panicle narrow	22. *adenanthus.*
42.	Leaves all radical	30. *oreophilus.*
	Leaves cauline	43.
43.	Flowers in axillary cymes	27. *pleiophyllus.*
	Flowers paniculate	44.
44.	Leaves ovate	45.
	Leaves oblong or linear oblong	4. *angustifolius.*
45.	Leaves cuneate at the base	22. *adenanthus.*
	Leaves rounded at the base	27. *pleiophyllus.*
46.	Calyx 1 mm. long and broad ; calyx teeth blunt	6. *Stracheyi.*
	Calyx more than 1 mm. long	47.
47.	Inflorescence paniculate	48.
	Inflorescence of axillary cymes ; leaves densely pubescent and reticulate beneath	31. *phyllostachys.*
48.	Inflorescence subglabrous	24. *nervosus.*
	Inflorescence woolly	16. *eriocalyx.*
49.	Corolla with a long slender spur	32. *calcaratus.*
	Corolla with a broad spur of moderate length	33. *macrocalyx.*

1. **Plectranthus ternifolius,** Don. ; Fl. Brit. Ind. iv, 621.

Elsholtzia Lychnitis, Léveillé et Vaniot in Fedde, Repert. Nov. Sp. viii, 425.

Flowers whitish to lavender, September and November. Dry open mountain sides.

KWEICHOW : Tchen-lin-tcheou, *Bodinier et Martin* ; Tou-tcheou, *Cavalerie*, 2573.

YUNNAN : Mountains east of Szemao at 5000 ft., *Henry*, 9020, 9020A ; Salween-Irrawadi divide, 5000–7000 ft., N. of Ya-ko, *Forrest*, 1043 ; Tali-fu to Tengyueh road, *Forrest*, 1007.

KWANGSI : Lungchow, *Morse*, 134.

KWANGTUNG: Mainland opposite Hongkong 2000–3000 ft., *Hance*, 745; common on the bare uplands above Taipo, *Dunn*.

2. **Plectranthus macranthus,** Hook. f.; Fl. Brit. Ind. iv, 616.

Hancea Hemsleyana, Léveillé in Fedde, Repert. Nov. Sp. ix, 223.

Flowers violet to rose-purple, August to September. Moist banks of streams, sides of marshes, etc., and in dense jungle.

SZECHUEN: Omi, *Wilson*, 5118A, B.

KWEICHOW: Pin-fa, *Cavalerie*, 363.

YUNNAN: Mingkwang-Irrawadi divide at 7000–8000 ft., *Forrest*, 961; Teng-yueh, *Howell*, 126.

3. **Plectranthus Prainianus,** Dunn in Notes Bot. Gard. Edin. xxxvii, 158.

Hancea Prainiana, Léveillé in Fedde, Repert. Nov. Sp. ix, 223.

Flowers violet, August.

KWEICHOW: near the cascades, Pin-fa, *Cavaleric*, 362.

4. **Plectranthus angustifolius,** Dunn in Notes Bot. Gard. Edin. xxxvii, 154.

Flowers dark or light purple. Grassy mountains.

HUPEH: Fang, *Wilson*, 2577.

YUNNAN: *Ducloux*, 274 (*fide* Henry); Mengtze, 5000–5500 ft., *Henry*, 10,069, 10,069A; near Yunnan-sen, *Maire*, 2497, 2600.

5. **Plectranthus Bulleyanus,** Diels in Notes Bot. Gard. Edin. xxv, 229.

Flowers deep blue, June. Dry situations among scrub and shady pastures.

YUNNAN: eastern flank of Tali range at 9000–10,000 ft., *Forrest*, 4554.

6. **Plectranthus Stracheyi,** Benth. Fl. Brit. Ind. iv, 618.

P. veronicifolius, Hance in Journ. Bot. 1885 (Nov.), 327.

Flowers white, November.

YUNNAN: Forests south of Szemao at 4000 ft., *Henry*, 12,721.

HAINAN: Hung-mo (Lai Distr.), *B. C. Henry*, Nov. 21, 1882.

7. **Plectranthus striatus,** Benth.; Fl. Brit. Ind. iv, 618.

P. Gerardianus,* Benth.; Fl. Brit. Ind. iv, 617.

P. Tatei, Hemsl. in Journ. Linn. Soc. xxvi, 274.

P. Esquirolii, Léveillé in Fedde, Repert. Nov. Sp. ix, 247.

Orthosiphon Bodinieri, Van. in Bull. Acad. Geogr. Bot. xiv, 170.

O. glabrescens, Van. l.c, 168.

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* *P. Gerardianus*, Benth.: see Notes Bot. Gard. Edin. xxxvii, 156.

Flowers from pale blue or white to dark red, June to January. Forest, woods, scrub, damp shady places, grassy mountains.*

SZECHUEN: W. China at 1200 ft. to 2800 ft., *Wilson*, 4376, 4377; Yangtze banks, W. China, *Wilson*, 4379.

HUPEH: Ichang, *Henry*, 2926; Chang-yang, *Henry*, 7689, *Wilson*, 2651; Mt. Omi, *Wilson*, 5120.

KWEICHOW: Ko-te-pang-kaou, *Esquirol*, 214; Kouy-yang, *Bodinier*, 2480.

YUNNAN: *Ducloux*, 266, 554; *Maire*, 313, 425, 647, 1293, 1582, 2030, 2344; mountains N. and S.E. of Mengtze, 5000–6500 ft., *Henry*, 9042, 9043, 9073, 9796, 9797, 9840, 10,071, 11,166, 11,266, 11,286; Mi-lê district, *Henry*, 10,071A, 10,072; Yuen-chang at 3500 ft., *Henry*, 11,576; Szemao, W. Mountains, at 5000 ft., *Henry*, 12,475; 12,581; Teng-yueh, *Howell*, 26; Yangtze Valley between Tzu-ko and Shih-ku at 6000–7000 ft., *Forrest*, 18; eastern flank of Tali range, *Forrest*, 6820; Yunnan-sen, *Bodinier*.

KWANGTUNG: Wong-yu, *Tate*; Lo-fou-shan at 3100 ft., *Ford*, 47; Lantao, *Dunn*; Lienchow River, *Matthew*.

8. **Plectranthus discolor,** Dunn in Notes Bot. Gard. Edin. xxxv, 155.

Flowers blue, August to October.

SZECHUEN: Min Valley, 4000–9000 ft., *Wilson*, 4321, 4322; between Ta-chien-lu and Chengtu, *Hosie*.

9. **Plectranthus leucophyllus,** Dunn in Notes Bot. Gard. Edin. xxxvii, 157.

Flowers, July to October.

SZECHUEN: Tung Valley, 1200 m., *Wilson*, 4319; between Ta-chien-lu and Chengtu, *Hosie*.

10. **Plectranthus rugosus,** Wall.; Fl. Brit. Ind. iv, 620.

Flowers white with rose or purple spots.

SZECHUEN: Ta-chien-lu, *Pratt*, 529.

11. **Plectranthus sculponiatus,** Van. in Bull. Acad. Géogr. Bot. xiv, 167.

Flowers very fragrant, blue or dull yellow, sometimes with a purple blotch on the lower lip, August to October. Moist valleys, pine woods.

KWEICHOW: Gan-pin, *Bodinier*, 1942.

YUNNAN: *Ducloux*, 220; *Maire*, 26, 400, 520, 1609, 2023, 2318; foot of mountains at Mengtze, *Hancock*, 430, *Henry*, 9235; Pu-erh at 4500 ft., *Henry*, 13,492; north of Tali-fu, 8000–

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* In shady places the flowers are paler, the leaves larger and often more pubescent.

11,000 ft., *Forrest*, 597; eastern flank of Lichiang range, 9000–10,000 ft., *Forrest*, 6345; Tung valley, *Wilson*, 4387–88.

12. **Plectranthus excisus,** Maxim.; Mél. Biol. ix, 423.

P. racemosus,[*] Hemsl. in Journ. Linn. Soc. xxvi, 273.

Flowers yellow, red, or purple, July to October. Ditches.

SZECHUEN: N. Wu-shan, *Henry*, 7049, *Wilson*, 4385; S. Wu-shan, *Henry*, 4855; Chang-yang, *Wilson*, 1682A.

HUPEH: Fang, *Wilson*, 2382, 2513, 2582, *Henry*, 6695, Patung, *Henry*, 2463, 7233; Tien-pong-scian at 1990 m., *Silvestri*, 2080; Ichang, *Henry*, 417.

13. **Plectranthus rubescens,** Hemsl. in Journ. Linn. Soc. xxvi, 273.

P. dichromophyllus, Diels in Engl. Jahrb. xxix, 562.

Flowers purple, August to October. Banks of streams.

HUPEH: Ichang, *Henry*, 974 (type).

SZECHUEN: W. China at 5000 ft., *Wilson*, 4375; Nan-chuan, *Rosthorn*, 1164; Lung-mo-ai, *Rosthorn*, 861.

14. **Plectranthus phyllopodus,** Diels in Notes Bot. Gard. Edin. xxv, 227.

P. leucanthus,[†] Diels in Notes Bot. Gard. Edin. xxv, 230.

Flowers blue or white, May to September. Mountain meadows and borders of pine forests.

YUNNAN: eastern flank of Tali range at 8000–11,000 ft., *Forrest*, 4555–56; hills of Yangtze-Mekong divide, 6000–10,000 ft., *Forrest*, 595.

15. **Plectranthus Henryi,** Hemsl. in Journ. Linn. Soc. xxvi, 271.

Flowers white with mauve dots.

HUPEH: Ichang, *Henry*, 2727, 2763, 3086, 3094.

16. **Plectranthus eriocalyx,** Dunn in Notes Bot. Gard. Edin. xxxvii, 155.

Flowers lavender-coloured, September and October. Sandy wastes.

SZECHUEN: Mt. Omi, October 1904, *Wilson*, 5125.

YUNNAN: Valley of Yangtse, between Chi-tien and Chin-ho, elevation of 6000–7000 ft., October 1904, *Forrest*, 587; near Yunnan-sen, *Maire*, 1599, 2024, 2040; sandy wastes on mountains near Mengtze, September 1893, 5500 ft., *Hancock*, 73; Mengtze at 4500 ft., *Henry*, 9811.

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[*] *P. racemosus*, Hemsl.: see note in Notes Bot. Gard. Edin. xxxvii, 158. This form is confined to C. China and can only be distinguished from *P. excisus*, Maxim., by its racemose flowers; its leaves are stalked *or* sessile, cuspidate *or* not, whereas in the latter they are always stalked and always cuspidate.

[†] *P. leucanthus*, Diels: the only difference observable in the type specimens of this and *P. phyllopodus*, Diels, is in the pubescence of the leaves.

17. **Plectranthus Cavaleriei,** Léveillé in Fedde, Repert. Nov. Sp. ix, 247.

KWEICHOW: *Esquirol*, 834.

18. **Plectranthus glaucocalyx,** Maxim.; Mél. Biol. ix, 426.

Flowers lilac, August to September. Grassy places.

CHILI: Pekin, *Carles*, *Hemeling*, *Bretschneider*, 600, *Satow*; W. Hills, Pekin, *Carles*; Miao-fêng-shan, Pekin, W. Hills, *Hancock*, 75.

SHANTUNG: *Williamson*; I-tu-hsien, Ching-chou-fu, *Couling*, 73A; grassy slopes on Lou-Shan, Tsingtau, *Dunn*.

19. **Plectranthus Coetsa,** Ham.; Fl. Brit. Ind. iv, 619.

P. leptobotrys, Diels in Engl. Jahrb. xxix, 561.

Flowers reddish, bluish, or white, August to October. Grassy mountains, forests, and wooded cliffs.

SZECHUEN: W. China at 6000 ft., *Wilson*, 4380, 4384.

HUPEH: Ou-tan-scian, 2090 m., *Silvestri*, 2079; Nanto, *Henry*, 2983.

YUNNAN: Mengtze, N. and S.W. mountains at 6000–8000 ft., *Henry*, 10,075, 10,238, 10,073, 10,073A, 11,279, 13,774: Szemao, south forests at 5000 ft., *Henry*, 12,698.

20. **Plectranthus Rosthornii,** Diels in Engl. Jahrb. xxix, 562.

Flowers October.

SZECHUEN: Nanchuan, Tien-sheng-chiao, *Rosthorn*, 1122.

21. **Plectranthus ricinispermus,** Pamp. in Nuov. Giorn. Ital., 1910, 707.

Flowers pink, September to October.

HUPEH: Fang, *Wilson*, 1682; Patung, *Wilson*, 2819; Yu-koan-tin at 6000 ft., *Silvestri*, 2082, 2082A; Ou-tan-scian, *Silvestri*, 2083, 2083A, B.

SZECHUEN: Chang-yang, *Wilson*, 2652.

22. **Plectranthus adenanthus,** Diels in Notes Bot. Gard. Edin. xxv, 228.

Flowers purple or blue, May to August. Grassy slopes and pine woods.

SZECHUEN: W. China at 3000 ft., *Wilson*, 4574; Tung valley, *Wilson*, 4382.

YUNNAN: east of Tali range, 10,000–11,000 ft., *Forrest*, 4557; Mengtze, 6000–7000 ft., *Hancock*, 567, 5000 ft., *Henry*, 13,792, 10,067, 10,067A.

23. **Plectranthus irroratus,** G. Forrest ex Diels l.c. 228.

Flowers blue, July. Stony pastures and dry shady places among undergrowth in pine forests.

YUNNAN : eastern flank of Lichiang range, 9000–10,500 ft., *Forrest*, 2507, 6143.

24. **Plectranthus nervosus,** Hemsl. in Journ. Linn. Soc. xxvi, 272.

P. moslifolius, Léveillé in Fedde, Repert. Nov. Sp. ix, 247.

Teucrium Mairei, Léveillé.

Flowers June to November.

HUPEH : W. Hupeh, *Wilson*, 483A ; Ichang, *Henry*, 992 (type), 1055 (type), 2725 (type) ; Patung, *Henry*, 5105 (type).

KIANGSU : Shanghai, *Carles*, 347, *Maingay*, 658.

KWEICHOW : Pin-fa, *Cavalerie*, 587.

KWANGTUNG : N. River, *Ford*, 25 (type) ; Lienchow River, *Matthew*.

YUNNAN : *Maire*, 1615, 2483.

25. **Plectranthus Forrestii,** Diels in Notes Bot. Gard. Edin. xxv, 229.

Flowers blue, July to August. Open mountain meadows and grassy glades in pine forests.

YUNNAN : eastern flank of Lichiang range, 11,000 ft., *Forrest*, 2851, 6243, 6462.

26. **Plectranthus amethystoides,** Benth. ; Mél. Biol. ix, 424.

*P. inflexus,** Vahl.

P. sinensis,† Miq. in Journ. de Bot. Néerl. i, 115.

Flowers slaty blue, January to September. Rocky hills.

SHANTUNG : Kiao-chow, *Zimmermann* ; Wei-hai-wei, *Matthew*.

CHEKIANG : Ningpo (Faber), *Hongkong Herb.* 333.

FUKIEN : Foochow, *Carles*, 679.

KIANGSI : Kewkiang, *Bullock*.

KWANTUNG : Canton, *Sampson*, 202, *Hance*, 10,531 ; Fan-ling, Hongkong, *Tutcher*.

27. **Plectranthus pleiophyllus,** Diels in Notes Bot. Gard. Edin. xxv, 228.

Flowers bright blue, June to August. Ledges of cliffs and dry stony pastures.

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* *P. inflexus*, Vahl : this MS. name was taken up by Bentham in his Addendum to the Monograph of *Labiatae*, but appears to be inseparable from *P. amethystoides*.

† *P. sinensis*, Miq. : the description does not distinguish it from the rather variable *P. amethystoides*, Benth., which is frequent in the region in which Miquel's plant was gathered.

YUNNAN: eastern flank of Lichiang range, 9000–12,000 ft., *Forrest*, 2333, 6313, 6395, 6603.

28. **Plectranthus grosseserratus,** Dunn in Notes Bot. Gard. Edin. xxxvii, 154.

SZECHUEN: Wu-shan, *Wilson*, 1429.

29. **Plectranthus megathyrsus,** Diels in Notes Bot. Gard. Edin. xxv, 230.

Flowers pale purplish blue, September. Among scrub and grass.

YUNNAN: western slopes of Tsan-shan range, 9000–10,000 ft., *Forrest*, 897.

30. **Plectranthus oreophilus,** Diels in Notes Bot. Gard. Edin. xxv, 227.

Flowers blue, July. Margins of pine forests.

YUNNAN: eastern flank of Lichiang range, 10,000–11,000 ft., *Forrest*, 2564, 6207.

31. **Plectranthus phyllostachys,** Forrest ex Diels in Notes Bot. Gard. Edin. xxv, 230.

Flowers a dirty yellow, September. Dry rocky situations, margins of forests.

YUNNAN: Hoching and Lichiang valley, 8000–12,000 ft., *Forrest*, 624, 6056, 6394.

32. **Plectranthus calcaratus,** Hemsl. in Hook. Ic. Pl. t. 2671.

Flowers lilac.

YUNNAN: Szemao forest at 4500 ft., *Henry*, 12,339.

33. **Plectranthus macrocalyx,** Dunn in Notes Bot. Gard. Edin. xxxvii, 157.

Flowers, November.

CHEKIANG: *Hickin*.

FUKIEN: Foochow, *Carles*, 734.

9. **Coleus,** Lour.; Fl. Brit. Ind. iv, 624.

1. Lip of corolla 5 times longer than the tube . . . . 2.
   Lip 3 times the tube . . . . . 1. *Esquirolii*.
2. Pubescent plant with papery leaves . . . 2. *bracteatus*.
   Glabrous with succulent leaves . . . 3. *carnosifolius*.

1. **Coleus Esquirolii,** Dunn in Notes Bot. Gard. Edin. xxxvii, 158.

Calamintha Esquirolii, Léveillé in Fedde, Repert. Nov. Sp. viii, 450.

Flowers lilac or purple, October to November. Rocks in shady places.

KWEICHOW : Shin-gny-hien, *Esquirol*, 1058 (type).

YUNNAN : Mengtze at 4600 ft., S.E. mountains at 4000–6000 ft., *Henry*, 9222, 9222A, *Hancock*, 235.

2. **Coleus bracteatus,** Dunn in Notes Bot. Gard. Edin. xxxvii, 158.

Flowers purple.

YUNNAN : Szemao, W. mountains at 5000 ft., *Henry*, 12,537 ; Pu-erh at 4500 ft., *Henry*, 13,498.

3. **Coleus carnosifolius,** Dunn in Notes Bot. Gard. Edin. xxxvii, 158.

Plectranthus carnosifolius, Hemsl. in Journ. Linn. Soc. xxvi, 269.

Flowers purple and white.

KWANGTUNG : N. River, *Ford*, 107.

10. **Anisochilus,** Wall. ; Fl. Brit. Ind. iv, 627.

Whole plant grey-strigose	1. *sinensis.*
Plant subglabrous	2. *pallidus.*

1. **Anisochilus sinensis,** Hance in Journ. Bot. 1885, 327.

Flowers, October.

HAINAN : Lam-ko, *B. C. Henry* (Hance, 22,207).

2. **Anisochilus pallidus,** Wall. ; Fl. Brit. Ind. iv, 629.

Flowers red.

YUNNAN : Szemao, south forests at 4000 ft., *Henry*, 12,675.

11. **Hyptis,** Jacq. ; Fl. Brit. Ind. iv, 630.

Hyptis suaveolens, Poit.; Fl. Brit. Ind. iv, 630.

Flowers, March to December, blue. Salt marshes.

FUKIEN : Amoy, *Hance*, 1485.

KWANGTUNG : Chao-chau-fu, *Dalziel* ; Hongkong, *Ford*, 73 ; Swatow, *Dunn* ; Macao, *Hance*, 1485.

HAINAN : *Henry*, 8736.

12. **Pogostemon,** Desf. ; Fl. Br. Ind. iv, 631.

1.	Leaves long-stalked ; calyx glabrous or with spreading hairs	2.
	Leaves narrowed into very short stalks ; calyx with adpressed pubescence . .	1. *Dielsianus.*

2. Flowers black when dry; lower calyx teeth setaceous . . . . . . 3.
Flowers pale when dry; calyx teeth all triangular . . . . . . 4.

3. Flower nearly twice as long as calyx . . 2. *fraternus.*
Flower only slightly longer than the calyx . . 3. *nigrescens.*

4. Calyx nearly glabrous; hairy part of filament exserted . . . . . 4. *glaber.*
Calyx hairy; hairy part of filament included . 5. *Championi.*

1. **Pogostemon Dielsianus,** Dunn in Notes Bot. Gard. Edin. xxxvii, 159.

Flowers rose, November. In scrub on dry rocky hillsides.

YUNNAN: Salween valley between Shih-chi-ti and Hsia-ku-ti, *Forrest*, 875.

2. **Pogostemon fraternus,** Miq.; Fl. Brit. Ind. iv, 635.

Flowers red. Damp sandy ground.

YUNNAN: Szemao forest at 4600 ft., *Henry*, 11,699.

3. **Pogostemon nigrescens,** Dunn in Notes Bot. Gard. Edin. xxxvii, 159.

Flowers red or purple. Shady woods.

YUNNAN: Mengtze, *Henry*, 9082; Feng-chen-lin, *Henry*, 11,174; Szemao, *Henry*, 12,563.

4. **Pogostemon glaber,** Benth.; Fl. Brit. Ind. iv, 633.

Flowers white tinged with pink. Woods.

YUNNAN: Mengtze, *Henry*, 10,418, 11,487; Szemao at 4500–5000 ft., *Henry*, 12,832.

5. **Pogostemon Championi,** Prain in Kew Bull. 1908, 254.

Flowers pale purple.

P. parviflorus, Benth. in Fl. Hongkong. 275 (non alibi). Flowers January.

KWANGTUNG: Hongkong, *Champion*, 339; Ha-hang, Hongkong New Territory, *Wong Kei*; Lienchow River, *Matthew*.

13. **Dysophylla,** Blume; Fl. Brit. Ind. iv, 637.

1. Leaves opposite . . . . . 1. *auricularia.*
Leaves verticillate . . . . 2.

2. Stem and leaves hirsute . . . . . 2. *cruciata.*
Stem and leaves glabrous or nearly so . . . 3.

3. Flower spike 5 mm. thick . . . . . . 4.
Flower spike 12 mm. thick . . . . 3. *linearis.*

4. Leaves 3 in a whorl, oblong-lanceolate obtuse . . . . 4. *Sampsoni.*
Leaves 4–10 in a whorl, linear, acute . . 5. *verticillata.*

1. **Dysophylla auricularia,** Bl.; Fl. Brit. Ind. iv, 638.

Flowers pink, January to August. Ditches.

YUNNAN: Szemao, 4500 ft., *Henry*, 12,311.

KWANGTUNG: Hongkong and neighbourhood, *Lamont*, 570, *Harland*, 468, *Champion*; Lo-fou-shan at 1000 ft., *Ford*, 3; Wampoa, *Hance*; Pakoi, *Playfair*; Ha-hang, Hongkong New Territory, *Wong Kei.*

HAINAN: *Henry*, 8168.

2. **Dysophylla cruciata,** Benth.; Fl. Brit. Ind. iv, 639.

HAINAN: *Carles*, 77, *Henry*; Hoihow, *Hance*, 20,307.

3. **Dysophylla linearis,** Benth.; Fl. Brit. Ind. iv, 639.

D. Martini, Van. in Bull. Acad. Géogr. Bot. xiv, 178.

Flowers pink to lavender, September. Wet places.

KWEICHOW: Tsin-tchen (Martin), *Bodinier*, 1946.

YUNNAN; Szemao, 4500–5000 ft. *Henry*, 12,226 & A, 12,628.

4. **Dysophylla Sampsoni,** Hance in Ann. Sci. Nat., 5th. sér. v, 234.

Flowers August. Damp situations.

KWANGTUNG: Canton, *Sampson* (Hance, 10,946).

5. **Dysophylla verticillata,** Benth.; Fl. Brit. Ind. iv, 639.

D. Esquirolii, Léveillé in Fedde, Repert. Nov. Sp. x, 476.

Flowers August, red. Ditches, padi fields.

KWEICHOW: Ten-chang, *Esquirol*, 155.

KWANGTUNG: Swatow, Tai-yong, *Dalziel*; Canton, *Hance*, 11,448; Hoi-fung, *Lo Quai*; Lienchow River, *Matthew.*

HAINAN: Tingan, *Katsumata.*

14. Colebrookia, Sm.; Fl. Brit. Ind. iv, 642.

Colebrookia oppositifolia, Sm.; Fl. Brit. Ind. iv, 642.

Flowers white, December. Grassy mountains.

YUNNAN: Shih-ping at 3000–4000 ft., *Henry*, 11,593, 11,593A, 11,593B; Mengtze at 5500 ft., *Henry*, 10,921; Szemao at 4500 ft., *Henry*, 12,740; Red River forests, *Hancock*, 248.

15. **Elsholtzia**, Willd.; Fl. Brit. Ind. iv, 642.

1. Bracts linear or subulate . . . . . . 2.
Bracts broad, blunt or acuminate . . . . . 12.

2. Leaves white-tomentose beneath, rugose . . . 3.
Leaves not tomentose, flat . . . . . 4.

3. Leaves abruptly acuminate below into a slender stalk . . . . . 1. *rugulosa.*
Leaves cuneate at the base, sessile; raceme tail-like . . . . . 2. *Myosurus.*

4. Leaves on slender petioles, rounded or shortly acuminate at base . . . . 5.
Leaves sessile . . . . . . 8.

5. Leaves large; plant shrubby large . . 3. *flava.*
Leaves small; humble annuals . . . . 6.

6. Flower spike slender, interrupted; bracts subulate . . . . . 4. *incisa.*
Flower spike stout, continuous; bracts linear . . . . 7.

7. Bracts strongly ciliate . . . . 5. *pilosa.*
Bracts pubescent . . . . . 6. *communis.*

8. Corolla tube 4 times as long as calyx . . . 9.
Corolla tube less than twice calyx . . . . 10.

9. Flowers 4–5 mm. long; whole plant roughly hairy . . . . . . 7. *polystachya.*
Flowers 9 mm. long; whole plant, except the inflorescence, glabrous . . . 8. *Stauntoni.*

10. Leaves nearly smooth above and almost glabrous beneath; calyx teeth linear, contracted together in fruit . . . . 11.
Leaves scabrous above, pubescent beneath; calyx teeth short, triangular, open in fruit . . . . . . 9. *ochroleuca.*

11. Leaves gradually narrowed to the base; calyx and corolla adpressed-pubescent . 10. *blanda.*
Leaves abruptly acuminate below; calyx and corolla woolly . . . 7. *polystachya.*

12. Leaves entire . . . . 11. *integrifolia.*
Leaves crenate or serrate . . . . . 13.

13. Leaves all linear or linear-lanceolate, sessile . . 14.
Leaves ovate or stalked . . . . . 15.

14. Stem tall, erect, simple; bracts nearly glabrous, reticulate, truncate, a little retuse or shortly cuspidate . . 12. *heterophylla.*
Stem branched or short and decumbent; bracts woolly, rounded or conspicuously cuspidate 20

15.	Spike unilateral ; plant annual	16.
	Spike multifarious	17.
16.	Flowers purple	13. *cristata*.
	Flowers yellow	14. *luteola*.
17.	Leaves small, ovate ; flower spike ovate	15. *kachinensis*.
	Leaves oblong or linear ; spike cylindric, woolly	18.
18.	Leaves nearly glabrous on both sides, serrate	16. *ianthina*.
	Leaves pubescent on both sides, crenate-serrate	19.
19.	Calyx teeth reflexed in fruit	17. *calycocarpa*.
	Calyx teeth erect in fruit	18. *eriostachya*.
20.	Annual with one-sided spike of yellow flowers	14. *luteola*.
	Perennial with quadrifarious purple flowers	19. *Bodinieri*.

1. **Elsholtzia rugulosa,** Hemsl. in Journ. Linn. Soc. xxvi, 278.

E. Labordei, Vaniot in Bull. Acad. Géogr. Bot. xiv, 177.

Plectranthus Labordei, Diels in Notes Bot. Gard. Edin. xxxi, 47.

Flowers white, yellowish, or lavender, August to October. Dry grassy and stony pastures and woods.

Kweichow : Tsin-gay (Laborde), *Bodinier*, 2711.

Yunnan : Yunnan-sen, *Maire*, 633, 1394, 1628, 2309, 2399 ; Luchang Hills, Salween-Irrawadi divide, *Forrest*, 1035 ; northern end of Lichiang valley at 9000 ft., *Forrest*, 6527 ; base of eastern flank of Tali range at 6700–8000 ft., *Forrest*, 6869 ; valley of Yangtze below Chu Tün at 7000–8000 ft., *Forrest*, 630 ; Mekong side of the Mekong-Salween divide, *Forrest*, 878 ; Pu-erh, *Bourne*, 34 ; Mengtze, 5000–6000 ft., *Hancock*, 410 ; Szemao at 4600 ft., *Henry*, 9912.

2. **Elsholtzia Myosurus,** Dunn in Notes Bot. Gard. Edin. xxxvii, 160.

Flowers dull yellow, August. Dry open places in scrub.

Yunnan : Eastern flank of Tali range at 7000–8000 ft., *Forrest*, 7220.

3. **Elsholtzia flava,** Benth. ; Fl. Brit. Ind. iv, 642.

Flowers fragrant, yellow to orange, May to September. Moist shady places.

Szechuen : W. China at 4500 ft., *Wilson*, 4339.

Chekiang : *Hickin*.

Yunnan : *Ducloux*, 520 ; Mengtze, north forests at 8000 ft., *Henry*, 10,239 ; among the hills in the neighbourhood of Yunnan-sen, *Maire*, 1778, 2036, 2171, 2174 ; eastern flank of

Lichiang range, 7000–9000 ft., *Forrest*, 4693, 6283; Yangtze valley above Na Le, 5000–8000 ft., *Forrest*, 523.

4. **Elsholtzia incisa,** Benth.; Fl. Brit. Ind. iv, 644.

Frequently recorded from S. China, but the voucher specimens seen by me prove to be *E. communis*, Diels.

5. **Elsholtzia pilosa,** Benth.; Fl. Brit. Ind. iv, 644.

Dysophylla Mairei, Léveillé.

Flowers white, pink, or lilac, September to October. Fields and dry pastures.

YUNNAN: *Ducloux*, 580; Tong-tchouan, 4500 m., *Maire*; Mengtze at 6000 ft., *Henry*, 9233, 9711; Yunnan-sen, *Maire*, 1204, 2035; Ming-kwang valley, 6000–7000 ft., *Forrest*, 947; northern end of Lichiang valley at 9000 ft., *Forrest*, 6680; Mekong at 6000–9000 ft., *Forrest*, 583, 588.

6. **Elsholtzia communis,** Diels in Notes Bot. Gard. Edin. xxxi, 47.

E. alopecuroides, Léveillé et Vaniot in Fedde, Repert. Nov. Sp. viii, 424.

Pogostemon Cypriani, Pamp. in Nuov. Giorn. Bot. Ital. 1910, 708.

Dysophylla communis, Coll. et Hemsl. in Journ. Linn. Soc. xxviii, 114.

Flowers pink or white, October. Waste ground, woods, and open grassy places on clay.

SHENSI: N. Shensi, *Giraldi*, 597.

HUPEH: Kao-tien-chan, *Silvestri*, 2085–88A; Nanto, *Henry*, 2889A; Ichang, *Henry*, 2889, 3272.

KWEICHOW: Pin-fa, *Cavalerie*, 1426.

YUNNAN: *Ducloux*, 509; common at 6000–11,000 ft. in all the valleys, *Forrest*, 628, 830, 831; Mengtze at 4600 ft., *Hancock*, 230, *Henry*, 9726; Mi-lê District, *Henry*, 9892; Yunnan-sen, *Maire*, 632, 1202, 1206, 1623.

7. **Elsholtzia polystachya,** Benth.; Fl. Brit. Ind. iv, 643.

E. tristis, Léveillé in Fedde, Repert. Nov. Sp. viii, 424.

E. Dielsii, Léveillé l.c. ix, 441.

E. Souliei, Léveillé l.c. ix, 248 (non 218).

Flowers yellow, pink, or white, July to October. Open shrubby pastures, dry stony ground, margins of pine forests.

CHILI: Zu-lu (Lan-yi-san Province), *Giraldi*; *Satow*.

SZECHUEN: Ta-chien-lu, *Soulié*, 781, *Hosie*; W. China, *Wilson*, 1299A, 4314.

HUPEH : Fang, *Henry*, 6755.

KWEICHOW : Kouy-yang, *Bodinier*, 1944.

YUNNAN : Yunnan-sen, *Maire*, 127, 634, 1235, 1300, 1637, 2173, 2310, 2602, 2604 ; *Ducloux*, 565 ; eastern flank of Tali range at 7000–9000 ft., *Forrest*, 4694, 4759 ; eastern flank of Lichiang range at 9000–11,000 ft., *Forrest*, 2681, 6333, 6549, 6617, 6718 ; Teng-yueh, *Howell*, 77 ; Mengtze at 5000–6000 ft., *Henry*, 6996, 11,305.

8. **Elsholtzia Stauntoni,** Benth. ; DC. Prodr. xii, 160.

Bot. Mag. t. 8460 (type).

Flowers September.

CHILI : mountain west of Pekin, *Forbes* ; Nan-kau, *Williams* (Hance, 14,608) ; Pekin, *Bretschneider*, 77.

9. **Elsholtzia ochroleuca,** Dunn in Notes Bot. Gard. Edin. xxxvii, 161.

Flowers pale yellow.

YUNNAN : Mengtze at 4700 ft., *Henry*, 9136.

10. **Elsholtzia blanda,** Benth. ; Fl. Brit. Ind. iv, 643.

Flowers white, fragrant.

YUNNAN : Mengtze at 5500 ft., *Henry*, 9250, 9250A, 10,070.

11. **Elsholtzia integrifolia,** Benth. Labiatae, 714.

CHILI : Jehol, *Staunton* (*olim in Herb. Banks*, Benth.).

12. **Elsholtzia heterophylla,** Diels in Notes Bot. Gard. Edin. xxv, 231.

Flowers pink. Open or wooded boggy ground.

YUNNAN : Mengtze, 5500–7000 ft., *Henry*, 9950A, 9950B, 10,305 ; Mi-lê District, *Henry*, 9950A ; Yunnan-sen, *Maire*, 1203, 1543, 2037 ; Ming-kwang valley north of Li-shih-toa-ho at 6000–7000 ft., *Forrest*, 934 ; eastern flank of Tali range at 8000–10,000 ft., *Forrest*, 7209.

13. **Elsholtzia cristata,** Willd. ; Fl. Brit. Ind. iv, 645.

E. Souliei, Léveillé in Fedde, Repert. Nov. Sp. ix, 218 (not 248).

E. Argyi, Léveillé l.c. viii, 425.

E. Feddei, Léveillé l.c. ix, 218.

Flowers lilac, September to November. Stony pastures and cultivated fields.

SHENSI : Thiu-kio-tchien, *Giraldi*.

CHILI : Peking, *Hemeling*, *Bretschneider*, 576.

SHANTUNG : Chefoo, *Carles*, 343 ; *Bullock*, 343 ; Tsingtau, *Dunn*.

HUPEH: Chang-yang Mts., W. Hupeh, *Wilson*, 1745, 4364, 5717; Ichang, *Henry*, 135, 159, 955, 2674.

SZECHUEN: Tongolo, *Soulié*, 226–27; Ta-chien-lu, *Hosie*.

KIANGSU: Chusan, *Home, R. Brown*; Shanghai, *Carles*, 406; Sio-le-kiao, *d'Argy*.

CHEKIANG: Ningpo, *Home*.

KIANGSI: Kewkiang, *Carles, Hickin*.

KWEICHOW: Pin-fa, *Cavalerie*.

YUNNAN: eastern flank of Lichiang range at 9000–10,000 ft., *Forrest*, 6699; abundant in Mekong and Yangtze valleys, 5000–11,000 ft., *Forrest*, 622; Yunnan-sen, *Maire*, 1205, 1640, 1762, 2317, 2494.

KWANGTUNG: Lienchau River, *B. C. Henry*.

14. **Elsholtzia luteola,** Diels in Notes Bot. Gard. Edin. xxv, 232.

Flowers pale yellow, September. Moist ground.

YUNNAN: Ching-tun plateau, 12,000–13,000 ft., *Forrest*, 625.

15. **Elsholtzia kachinensis,** Prain in Journ. As. Soc. Beng. lxxiii, 206.

Flowers purple, July to October. Marshy stony ground.

YUNNAN: *Ducloux*, 510; Yunnan-sen, *Maire*, 1624; Szemao, E. Mts. at 5000 ft., *Henry*, 12,670; Ming-kwang Valley north of Machung at 6000–7000 ft., *Forrest*, 946; Lichiang valley at 8500 ft., *Forrest*, 6729; eastern flank of Tali range at 7000–9000 ft., *Forrest*, 7042, 7195; Tali-fu and Ting-chuan valleys at 6500–8000 ft., *Forrest*, 585.

16. **Elsholtzia ianthina,** Dunn.

Dysophylla ianthina, Maxim. ex Kanitz Növquyt. gyujtesek grof. Szeckenyi (1891) 46.

Flowers June to August. Wet meadows or shallow water.

KANSU: south of Tetuaz River, *Przewalski*, 387; foot of northern ridge, *Przewalski*, 96.

17. **Elsholtzia calycocarpa,** Diels in Engl. Jahrb. xxix, 560.

Flowers July.

SZECHUEN: Tsa-ku-lao, *Rosthorn*, 2543.

18. **Elsholtzia eriostachya,** Benth.; Fl. Brit. Ind. iv, 645.

Flowers yellow.

KANSU: *H. F. Ridley*.

SZECHUEN: Tongolo, *Soulié*, 375; Ta-chien-lu, *Soulié*, 93; *Pratt*, 884.

19. **Elsholtzia Bodinieri,** Vaniot in Bull. Acad. Géogr. Bot. xiv, 176.

Flowers rose-lavender, September to November. Exposed rocky places.

YUNNAN: Yunnan-sen, *Bodinier*, 2547; *Maire*, 1542, 2396; Yuan-chang at 5000 ft., *Henry*, 9368B; Mengtze at 6000 ft., *Henry*, 9368, 9368A; summit of Sung-kwei pass at 11,000-12,000 ft., *Forrest*, 7371; mountains west of Tali-fu at 9000 ft., *Forrest*, 586; eastern flank of Lichiang range at 9000–10,500 ft., *Forrest*, 2997.

16. **Keiskia,** Miq. in Ann. Mus. Bot. Lugd. Bot. ii, 105.

Keiskia japonica, Miq. l.c.

KIANGSU: recorded there by Hemsl. in Journ. Linn. Soc. xxvi, 279.

17. **Hancea,** Hemsl.* in Journ. Linn. Soc. xxvi, 309.

1. Corolla tube expanded at middle to 4 times its width below	1. *sinensis.*
Corolla tube cylindric	2.
2. Corolla tube 1.3 cm. long	2. *nudipes.*
Corolla tube 2.4 cm. long	3. *Cavaleriei.*

1. **Hancea sinensis,** Hemsl. in Journ. Linn. Soc. xxvi, 310, t. 6.

Flowers dark purple, July.

SZECHUEN: Ta-chien-lu, *Pratt*, 152; Omi, *Faber*, 666, 681 (types), *Wilson*, 5124, 5132; W. China, *Wilson*, 4373 (4000 ft.).

YUNNAN: Mengtze, S.E. Mts., *Henry*, 9196.

2. **Hancea nudipes,** Dunn in Notes Bot. Gard. Edin. xxxvii, 170.

Plectranthus nudipes, Hemsl. in Journ. Linn. Soc. xxvi, 272.

SZECHUEN: N. Wushan, *Henry*, 7037; Kuan-shien Mts. at 5000 ft. (50 miles north-west of Chengtu), *Fergusson*.

3. **Hancea Cavaleriei,** Léveillé in Fedde, Repert. Nov. Sp. ix, 224.

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* The position of *Hancea* next to *Keiskia* in the *Saturineae* instead of in the place (*Prasieae*), suggested by its author, Hemsley, requires explanation. When established by that author its fruit was unknown and, *Prasieae* and *Saturineae* not being entirely distinguishable except by the characters of the nutlets, he doubtfully placed it in the former. Ripe fruits having now been received from Léveillé, and the nutlets proving to be naturally quite dry, it may be placed in *Saturineae* as Léveillé himself suggested to me. It is only distinguished from *Plectranthus* by the expansion of its corolla into a limb of five flat lobes, by the divaricate, not declinate, stamens. A certain accommodation of species is necessary in consequence of this unexpected affinity. *Plectranthus nudipes*, Hemsl., is here transferred to *Hancea*, *Hancea Hemsleyana* and *Prainiana*, Léveillé, to *Plectranthus*.

18. **Perilla**, Linn. ; Fl. Brit. Ind. iv, 646.

1. Whole plant shaggy . . . . . . 1. *ocymoides*.
Plant glabrous or pubescent . . . . . . 2.

2. Calyx 1.1–1.3 cm. long ; seeds white . . . 2. *avium*.
Calyx 6–7 mm. long ; seeds reddish . . 3. *nankinensis*.

1. **Perilla ocymoides,** Linn. ; Fl. Brit. Ind. iv, 646.

Flowers white.

HUPEH : *Henry*, 4455, 4971.

2. **Perilla avium,** Dunn in Notes Bot. Gard. Edin. xxxvii, 161.

Flowers white, October. Cultivated.

CHILI : Pekin, *Bretschneider*, 577, *Carles*, 140.

FUKIEN : Foochow, *Carles*, 733.

YUNNAN : S.W. China, *Bourne*, 2 ; Salween and Irrawadi basins, *Forrest*, 871 ; Yunnan-sen, *Maire*, 25, 734, 2614.

KWANGTUNG : Swatow, *Dunn*.

3. **Perilla nankinensis,** Decne. in Rev. Hort. 1852, 61.

P. arguta, Benth. Fl. Hongk. 276.

P. Cavaleriei, Léveillé in Fedde, Repert. Nov. Sp. viii, 424.

Flowers pink, April to September. Waste ground.

CHILI : Pekin to Jehol, *Staunton*.

HUPEH : *Henry*, 4356 ; Hokiang, *Henry*, 692 ; S. Wu-shan, *Wilson*, 2659 ; Ichang, *Henry*, 459, 1050, 2607, 3023, 2258A.

KIANGSU : Shanghai Hills, *Carles*, 15.

CHEKIANG : *Hickin*.

FUKIEN : Foochow, *Carles*, 15.

KWEICHOW : Tsin-gay, *Cavalerie*, 2709, 2710.

KIANGSI : Lungchow, *Morse*, 520.

KWANTGUNG : Hongkong, *Forbes*, *Faber*, *Carles*, 348, *Maingay*, 536, 537, *Hance* ; Macao, *Callery*, 158 ; Canton, *Hance*, 6546 ; Lantao, *Dunn*.

19. **Mosla**, Ham. ; Fl. Brit. Ind. iv, 646.

1. Flowers within large bracts . . . . 1. *chinensis*.
Flowers bare . . . . 2.

2. Seeds reticulate . . . . 3.
Seeds opaque smooth ; leaves long-stalked ovate, crenate-dentate : seeds spherical, opaque . . . . . . 2. *Cavaleriei*.

3. Seeds closely reticulate, deeply pitted . . 3. *lanceolata*.
Seeds loosely reticulate, flat . . . . 4. *dianthera*.

1. **Mosla chinensis,** Maxim. in Mél. Biol. xi, 805; Dunn in Notes Bot. Gard. Edin. xxxvii, 162.

M. Fordii, Maxim. in Mél. Biol. xii, 525.

Calamintha clipeata, Vaniot in Bull. Acad. Géogr. Bot. xiv, 184.

Flowers June to September.

Hupeh: Ichang, *Henry*, 2240, 4325.

Chekiang: *Hickin.*

Fukien: Foochow, *Carles*, 725.

Kweichow: near Lau-shan, *Bodinier*, 2669.

Kwangtung: Lienchow River, *Hongkong Herb.*, 1333; Wong-lun-kun, Lo-fou-shan, 3100 ft., *Ford.*

2. **Mosla Cavaleriei,** Léveillé in Fedde, Repert. Nov. Sp. ix, 247.*

Flowers rose, September. Stream banks.

Kweichow: Pin-fa, *Cavalerie*, 530.

3. **Mosla lanceolata,** Maxim. in Mél. Biol. ix, 434.

M. Argyi, Léveillé in Fedde, Repert. Nov. Sp. ix, 248.

Calamintha Argyi, Léveillé l.c. viii, 423.

Flowers purple, September to October. Fields.

Hupeh: Patung, Nanto, Ichang, *Henry*, 61, 2319, 2560, 2609, 2790, 4812, 4895–97, 5017, 7376.

Shantung: Tsingtau, *Zimmermann.*

Kiangsu: hills near Shanghai, *Carles*, 225.

Chekiang: *Hickin*; Ningpo, *Faber*, 61, 81, 334, 1710.

Fukien: Amoy, *Hance*, 1484 (type); Foochow, *Carles*, 772.

Kiangsi: Kewkiang, City Wall, *Carles*, 226; *Shearer*; Lushan, *Bullock*, 62.

Kiangsu: Sin-kia-wei, Souo-se, *d'Argy*.

Kwangtung: Whampoa, *Hance*, 1484 (type); Danes' Island, *W. Brown*; Swatow, *Dunn*; Hongkong, *Wright*, 492; Lo-fou-shan, *Ford*, 30; Sze-se-shan, *Wong Kei.*

4. **Mosla dianthera,** Maxim. in Mél. Biol. ix, 431; Dunn in Notes Bot. Gard. Edin. xxxvii, 162.

M. soochouensis, Matsuda ?

M. punctata, Maxim. in Mél. Biol. ix, 436.

Flowers pink, August to September. Roadsides.

Shantung: Chefoo, *Faber*, 116.

Hupeh: Ichang, *Henry*, 865, 2274, 2489, 2742; Kiating, *Wilson*, 4378.

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* *Mosla Cavaleriei*, Léveillé.—Diagnosis amplificata: Herba gracilis, caule sparse hirsuto. *Folia* ovata, acuta, basi breviter acuminata, 3–4 cm. longa, papyracea, utrinque sparse hirsuta, serrata, petiolo lamina paullo breviore. *Racemi* terminales axillaresque, 5–7 cm. longi, 1 cm. lati, omnino hirsutuli. *Flores* oppositi, singuli bracteaeque lineares 2 mm. longi; pedicelli calyci aequilongi. *Calyx* campanulatus, 1 mm. longus; dentes lineares tubo longiores. *Corolla* cylindrica, calyce bis longior, apice summo breviter lobata. *Stamina* duo, inclusa. *Styli* paullo exserti. *Nuculae* sphericae, opacae, 0.3 mm. diametro.

Kiangsu: Shanghai, *Carles*, *Maingay*, 534.

Fukien: Foochow, *Carles*, 736.

Kwangtung: Lo-fou-shan at 3100 ft., *Ford*, 40; *Hance*, 22,288; Swatow, Thaiyong, *Dalziel*; Kwai-sin, *Lo Quai*; Lienchow River, *Matthew*; Ma-lo-tong, *Tutcher*.

20. **Mentha,** Linn.; Fl. Brit. Ind. iv, 647.

Flowers in short terminal racemes . . .	1. *Malinvaldi.*
Flowers in axillary whorls	2. *arvensis.*

1. **Mentha Malinvaldi,** Léveillé in Fedde, Repert. Nov. Sp. iii, 21.

Flowers October. Stream sides.

Kweichow: Tin-fan, *Cavalerie*, 1933.

2. **Mentha arvensis,** Linn.; Fl. Brit. Ind. iv, 648.

Flowers lavender, September and October. Ditches and marsh-edges.

Chili: Pekin, *Bretschneider*, 578–79.

Shantung: Ching-chou-fu, *Couling*.

Shensi: *Giraldi*.

Szechuen: *Henry*, 7210.

Hupeh: Nanto, *Henry*, 2637, 2735; Ichang, *Henry*, 66, 72; W. Hupeh, *Wilson*, 2528A.

Kiangsu: Shanghai, *Maingay*, 539, *Carles*.

Fukien: Foochow, *Carles*, 690.

Yunnan: *Ducloux*, 208; eastern flank of Lichiang range at 9000 ft., *Forrest*, 2559; Lichiang valley, *Forrest*, 2560; Tali valley, *Forrest*, 4531; base of eastern flank of Tali range, *Forrest*, 6897; Mengtze at 4500 ft., *Henry*, 10,428, 10,428A; Szemao, W. Mts., *Henry*, 10,428B; Yunnan-sen, *Maire*, 923.

Kwangtung: Hongkong, Saiwan, *Hance*, 2982; Kwai-sin, *Lo Quai*; Sun Wai, *Tutcher*.

21. **Lycopus,** Tourn.; Fl. Brit. Ind. iv, 648.

Leaf-serrations acuminate, pungent . . .	1. *lucidus.*
Leaf-serrations blunt	2. *europaeus.*

1. **Lycopus lucidus,** Linn.; DC. Prodr. xii, 178.

Flowers July. Water sides.

Chili: Pekin, *Bretschneider*, 598; *Staunton*.

Shantung: Wei-hai-wei, *Dunn*.

Hupeh: *Henry*, 5197; Patung, *Henry*, 4597; W. Hupeh, *Wilson*, 1537.

Kiangsu: Shanghai, *Faber*.

Yunnan: Yunnan-sen, *Maire*, 657, 1220, 1877, 2527; Mengtze, rare, *Hancock*, 207; Szemao, *Henry*, 12,618.

Kwangtung: Kwai-sin, *Lo Quai*.

2. **Lycopus europaeus,** Linn. ; Fl. Brit. Ind. iv, 648.

L. Cavaleriei, Léveillé in Fedde, Repert. Nov. Sp. viii, 423.
Flowers bluish white, August.
Chili : Pekin, *Bretschneider,* 583.
Kweichow : Tou-an-gué, *Cavalerie,* 2480.

22. **Origanum,** Tourn. ; Fl. Brit. Ind. iv, 648.

Origanum vulgare, Linn. ; Fl. Brit. Ind. iv, 648.

Flowers pink, July to October. Dry grassy places.
Shensi : *Giraldi.*
Szechuen : Ta-tsien-lu, *Pratt,* 604, *Hosie.*
Hupeh : *Henry,* 623 ; Ichang, *Henry,* 2140, 2414 ; Hankow, *Carles* ; W. Hupeh, *Wilson,* 1529 ; *Silvestri,* 2060.
Kiangsu : Chinkiang, *Carles,* 478.
Chekiang : *Barchet* ; Wenchow, *Bowring.*
Kiangsi : *David* ; Kewkiang, *Shearer.*
Yunnan : Lichiang range at 8200 ft., *Forrest,* 2528 ; eastern flank of Tali range at 7000–9000 ft., *Forrest,* 4532 ; base of eastern flank of Lichiang range at 8000–9000 ft., *Forrest,* 5767 ; Mengtze, *Henry,* 11,137, *Hancock,* 209 ; Yunnan-sen, *Maire,* 314, 1590, 2692.

23. **Thymus,** Linn. ; Fl. Brit. Ind. iv, 649.

Thymus Serpyllum, Linn. ; Fl. Brit. Ind. iv, 649.

Flowers whitish, June to September. Grassy slopes.
Chili : (Pierson), *Hance,* 7103.
Shantung : Chefoo hillsides, *Carles,* 333, *Williamson, Maingay,* 46 ; Wei-hai-wei, *Matthew, Dunn.*

24. **Micromeria,** Benth. ; Fl. Brit. Ind. iv, 649.

Micromeria biflora, Benth. ; Fl. Brit. Ind. iv, 650.

Thymus Cavaleriei, Léveillé in Fedde, Repert. Nov. Sp. xi, 298.
Flowers rose, June. Sandy hills.
Kweichow : Tin-lan, *Cavalerie,* 3778.
Yunnan : Yunnan-sen, *Maire,* 1843.

25. **Calamintha,** Moench. ; Fl. Brit. Ind. iv, 650.

Bracts minute . . . . . . 1. *gracilis.*
Bracts varying from the length of the pedicel to the length of pedicel and flower together . . . . . 2. *Clinopodium.*

1. **Calamintha gracilis,** Benth. in DC. Prodr. xii, 232.

C. confinis, Hance in Journ. Bot. 1868, 331.

C. radicans, Van. in Bull. Acad. Géogr. Bot. xiv, 18.

Flowers lilac or pink, April to September. Dry grassy or waste places.

Shantung : *Faber*, 304.

Szechuen : Chien-shi, W. China, *Wilson*, 911.

Hupeh : *Henry*, 1957 ; Ichang, *Henry*, 252, 1198.

Kiangsu : Shanghai, *Carles*, 354.

Fukien : Foochow, *Carles*, 611 ; Yuen-ki, *Dunn*.

Yunnan : *Ducloux*, 8.

Kweichow : Hoang-ko-chou (Seguin), *Bodinier*.

Kwangtung : Chaochoufu, *Dalziel*, *Dunn* ; Sai-chu-shan (Sampson), *Hance*, 13,045 ; Hongkong, Peak District common, *Dunn*, *Ford*, 145 ; Pakwan, *Hance*, 7489 ; Hongkong, Victoria Peak, *Bodinier*, 1131.

2. **Calamintha Clinopodium,** Benth.

Key to Varieties of C. Clinopodium.

1.	Bracts as long as the calyx	2.
	Bracts shorter than the calyx	3.
2.	Leaves medium in size	var. *typica.*
	Leaves large	var. *discolor.*
3.	Bracts from half as long to nearly as long as the calyx	4.
	Bracts less than half the calyx	6.
4.	Stem creeping ; bracts few	var. *repens.*
	Stem erect or ascending	5.
5.	Flowers large, twice as long as the calyx ; hairs spreading	var. *megalantha.*
	Flowers small ; bracts few ; hairs deflexed	var. *chinensis.*
6.	Leaves large	var. *pratensis.*
	Leaves small	7.
7.	Stem branched erect ; hairs spreading	8.
	Stem decumbent ; bracts few ; flowers small	var. *umbrosa.*
8.	Heads small, numerous	var. *polycephala.*
	Heads few	var. *nepalensis.*

var. **typica.**

Calamintha Clinopodium, Benth. ; Fl. Brit. Ind. iv, 650.

Flowers pink. Grassy places.

Yunnan : Mengtze at 5000 ft., *Henry*, 9231A ; N.W. Yunnan, *Monbeig*, 214.

var. **discolor.**

Calamintha discolor, Diels in Notes Bot. Gard. Edin. xxv, 232.

Flowers pale rose-purple, June and July. Grassy open glades in forests.

Hupeh : Changyang, *Wilson*, 2512.

Yunnan : south of Red River from Manmer at 6000 ft., *Henry*, 9766 ; eastern flank of Tali range at 9000–10,000 ft., *Forrest*, 4527 (type).

var. **repens.**

Calamintha repens, Benth. ; DC. Prodr. xii, 233.

Flowers, June.

Szechuen : Mt. Omi, *Wilson*, 5133.

var. **megalantha.**

Calamintha chinensis, var. *megalantha*, Diels in Notes Bot. Gard. Edin. xxv, 233.

Flowers rose, June to August. Open ground.

Yunnan : eastern flank of Lichiang range at 10,000–11,000 ft., *Forrest*, 6322, *Forrest*, 2476 (type).

var. **chinensis.**

Calamintha chinensis, Benth. in DC. Prodr. xii, 233.

Flowers pink, May to November. Waste fields and grassy places.

Chili : Peiling, Pekin, *Webster* ; Pekin, *Bretschneider*, 585.

Shantung : *Maingay*, 45 ; Wei-hai-wei, *Matthew*.

Hupeh : W. Hupeh, *Wilson*, 810.

Chekiang : *Barchet*.

Kiangsi : Shanghai, *Faber*.

Fukien : Amoy, *Hance*, 7581.

Yunnan : near Mengtze at 5000 ft., *Henry*, 9231 ; Yunnansen, *Maire*, 777, 1471, 1759, 1299 ; eastern flank of Lichiang range at 9000–10,500 ft., *Forrest*, 2309.

Kwangtung : North River, *Hance*, 7581.

Hainan : *Katsumata*.

var. **pratensis,** Dunn.

Hupeh : Ichang and Patung, *Henry*, 1333, 1830a, 4916.

var. **umbrosa.**

C. umbrosa, Benth. in DC. Prodr. xii, 232.

C. tsacapanensis, Léveillé in Fedde, Repert. Nov. Sp. viii, 423.

Melissa umbrosa, Bieb.

Flowers rose to purple, May to July. Stony and grassy ground.

Hupeh : *Henry*, 943, 3661 ; Ichang, *Henry*, 757, 1013, 2778 ; Hankow, *Carles*.

Kiangsu : Shanghai, *Carles*, 355 ; Tsacapan, *d'Argy*.

Fukien : Amoy at 1700–1800 ft., *Hance*, 1483 ; Foochow, *Carles*, *Dunn*.

Yunnan : Mengtze at 5000 ft., *Henry*, 11,824 ; eastern flank of Lichiang range at 9000–10,500 ft., *Forrest*, 2309A ; Tali valley at 6700–8000 ft., *Forrest*, 4528 ; eastern flank of Tali range at 7000–9000 ft., *Forrest*, 4522 ; Yunnan-sen, *Maire*, 778, 2042, 2187, 2303, 2694.

Kwangtung : Swatow, Thai-yong, *Dalziel*.

var. **polycephala.**

Calamintha polycephala, Vaniot in Bull. Acad. Géogr. Bot. xiv, 183.

Flowers pink, September. Hedges.

Kweichow : Gan-pin, *Bodinier*, 1941.

Yunnan : common on Mekong-Yangtze divide at 10,000 ft., *Forrest*, 584.

var. **nepalensis.**

Melissa nepalensis, Benth.

Flowers rose, August. Dry stony places.

Hupeh : Ichang, Patung, *Henry*, 3661, 4841.

Yunnan : Momien, *Anderson* ; eastern flank of Tali range at 7000–8000 ft., *Forrest*, 4529.

26. **Melissa,** Linn. ; Fl. Brit. Ind. iv, 651.

Melissa parviflora, Benth. ; Fl. Brit. Ind. iv, 651.

Calamintha Cavaleriei, Léveillé in Fedde, Repert. Nov. Sp. viii, 424.

Flowers rose-purple to whitish, July to August. Open stony or bushy ground.

Hupeh : Omi-shan, *Wilson*, 5130.

Kweichow : Pin-fa, *Cavalerie*, 488, 3055.

Yunnan : Tali range at 6700–8000 ft., *Forrest*, 4538, 7286 ; Yunnan-sen, *Maire*, 780, 2158, 2651, *Ducloux*, 116 ; Mengtze, forests to north at 8000 ft., *Henry*, 10,214, 10,214A.

27. **Salvia,** Linn. ; Fl. Brit. Ind. iv, 653.

1.	Flowers large	2.
	Flowers small	18.
2.	Leaves pinnate	3.
	Leaves simple	6.

3. Exserted part of corolla tube longer than the lobes . . . 1. *trijuga*.
Exserted part shorter than the lobes . . . 4.

4. Terminal leaflet similar in shape to the side ones, less than twice as long . . . 5.
Terminal leaflet linear-oblong, more than 3 times as long as the side ones . . . 2. *yunnanensis*.

5. Upper lip of blue corolla straight ; leaflets at least 7 in number ; calyx cylindric, 3–4 times longer than broad . . . 3. *Bowleyana*.
Upper lip of yellow or blue corolla hooded ; leaflets at most 5 or very rarely 7 ; calyx campanulate, not twice as long as broad . . . 4. *miltiorrhiza*.

6. Corolla tube cylindric or gradually wider above calyx . . . 7.
Corolla tube suddenly enlarged above the calyx . . . 15.

7. Most of the leaves widely hastate . . . 8.
Leaves not widely hastate . . . 9.

8. Corolla tube ¼ longer than calyx . . . 5. *Roborowskii*.
Corolla tube 2–3 times calyx . . . 6. *tricuspis*.

9. Leaves round in outline . . . 10.
Leaves oblong, cordate or sagittate . . . 12.

10. Corolla tube less than twice as long as the campanulate calyx . . . 7. *campanulata*.
Corolla tube 2–3 times the calyx . . . 11.

11. Calyx cylindric, half the corolla tube . . . 8. *cynica*.
Calyx campanulate, one-third of corolla tube . . . 9. *Maximowicziana*.

12. Flowers in dense verticils subtended by large bracts . . . 10. *hians*.
Flowers fewer and bracts small . . . 13.

13. Leaves tomentose beneath . . . 11. *Przewalskii*.
Leaves pubescent beneath . . . 14.

14. Calyx cylindric ; leaves truncate at base . . . 12. *glutinosa*.
Calyx campanulate ; leaves sagittate . . . 13. *brevilabra*.

15. Leaves white-silky tomentose beneath, elliptic . . . 14. *digitaloides*.
Leaves not tomentose beneath ; hastate or cordate . . . 16.

16. Calyx cylindric, as long as the exserted part of corolla tube . . . 15. *umbratica*.
Calyx campanulate, half as long as exserted part of corolla tube . . . 17.

17. Upper leaves truncate or sagittate at base . . . 16. *Bulleyana*.
Upper leaves cuneate at base . . . 17. *castanea*.

18. Leaves lanceolate narrowed to a short petiole; flowers under 1 cm. in a dense terminal panicle . . . . . 19. *japonica.*
Leaves pinnate or cordate; flowers over 1 cm. in long interrupted racemes . . 18. *plebeia.*

1. **Salvia trijuga,** Diels in Notes Bot. Gard. Edin. xxv, 237.

Flowers deep lavender, September. Dry open places.

YUNNAN: Lichiang valley at 8500 ft., *Forrest*, 65, 2813, 6562.

2. **Salvia yunnanensis,** C. H. Wright in Kew Bull. 1896, 164.

S. Bodinieri, Vaniot in Bull. Acad. Géogr. Bot. xiv, 191.

S. Esquirolii, Léveillé in Fedde, Repert. Nov. Sp. viii, 421.

Flowers violet, blue, or purple, August. Exposed rocky slopes.

KWEICHOW: Hin-y-hien Mountain, *Bodinier*, 1504. Lung-chen-po, *Esquirol*, 572.

YUNNAN: *Ducloux*, 159; Tali range, *Forrest*, 2047, 4543, 7248; Yunnan-sen, *Maire*, 217, 1294, 2220, 2266, 2661, 7248; S.W. Mentgze at 4600–6500 ft., *Hancock*, 61 (type), *Henry*, 10,053.

3. **Salvia Bowleyana,** Dunn in Journ. Linn. Soc. xxxviii, 363.

Flowers blue, June to November. Grassy places along rivers.

FUKIEN: Yuen-fu River, *Carles, Dunn.*

4. **Salvia miltiorrhiza,** Bunge; Mél. Biol. xi, 304.

S. pogonocalyx, Hance in Journ. Linn. Soc. xiii, 85.

S. anomala, Vaniot in Bull. Acad. Géogr. Bot. xiv, 190.

S. Charbonnetii, Léveillé in Fedde, Repert. Nov. Sp. ix, 220.

Flowers blue, rose, or yellow, May to August. Cultivated fields and grassy places.

CHILI: Fuping, *Chanet*, 546; Ming tombs, *Bodinier*, 144; Pekin, *Satow*, *Hemeling*, *Forbes*, *Hance*, 6514, 11,432, *Bretschneider*, 586, *Hancock*, 44, *Bushell*; Pekin Hills, *Carles*, 159; Great Wall at Tinghai, *Sandilands.*

SHANTUNG: *Carles*; Chefoo, *Perry*, *Swinhoe*; Kiaochau, *Dunn.*

HUPEH: Ichang, *Henry*, 488, 1347, 1997; W. Hupeh, *Wilson*, 402.

GANWHAI: Wuhu, *Carles.*

CHEKIANG: *Barchet.*

KIANGSU: Shanghai, *Carles*, 160.

KIANGSI: Kiukiang, *Shearer*, *Forbes.*

KWEICHOW: Tong-chang, *Esquirol.*

5. **Salvia Roborowskii,** Maxim.; Mél. Biol. xi, 302.
KANSU: *Przewalski.*

6. **Salvia tricuspis,** Franch. in Bull. Soc. Phil. Par. sér. 8, iii, 150.
S. Marretii, Léveillé in Fedde, Repert. Nov. Sp. ix, 220.

Flowers pale yellow or pink. Cultivated fields.

SZECHUEN: Ta-chien-lu, *Soulié* (type), 627; Tongolo, *Soulié*, 238; W. China at 8500 ft., *Wilson*, 4346–47.

7. **Salvia campanulata,** Wall.; Fl. Brit. Ind. iv, 654.
S. hylocharis, Diels in Notes Bot. Gard. Edin. xxv, 236.
S. Forrestii, Diels l.c. 235.

Flowers orange, June to August. Alpine meadows and open glades in forests.

YUNNAN: Lichiang and Tali ranges at 9000–12,000 ft., *Forrest*, 2394, 4548, 5678.

8. **Salvia cynica,** Dunn in Notes Bot. Gard. Edin. xxxvii, 164.

SZECHUEN: Ta-chien-lu, *Pratt*, 71; Wu-shan at 6500 ft., *Wilson*, 4342.

9. **Salvia Maximowicziana,** Hemsl. in Journ. Linn. Soc. xxvi, 285.
S. Fargesii, Léveillé in Fedde, Repert. Nov. Sp. ix. 220.

Flowers yellow, white, or purple, July to August.

SZECHUEN: O-mi-shan at 6000 ft., *Henry*, 672, *Wilson*, 4343, 5126; Tchen-kéou-tin, *Farges*, 31.

HUPEH: *Henry*, 6822; Fang, *Henry*, 6864 (type), *Wilson*, 1688, 2349, 2399.

10. **Salvia hians,** Royle; Fl. Brit. Ind. iv, 653.
S. Prattii, Hemsl. in Journ. Linn. Soc. xxiv, 316.
S. Souliei, Léveillé in Fedde, Repert. Nov. Sp. ix, 219.

Flowers purplish-rose, June to September. Rocks and stony pastures.

SZECHUEN: Ta-chien-lu, *Soulié*, 600, *Pratt*, 491, 546; Tongolo, *Soulié*, 300.

YUNNAN: Tse-kou, *Monbeig*; eastern flank of Lichiang range at 11,000–14,000 ft., *Forrest*, 2919, 5754, 5811, 5970.

11. **Salvia Przewalskii,** Maxim.; Mél. Biol. xi. 301.
S. mandarinorum, Diels in Engl. Jahrb. xxix, 557.
S. thibetica, Léveillé in Fedde, Repert. Nov. Sp. ix, 219.

S. tatsiensis, Franch. in Bull. Soc. Philom. Par. sér. 8, iii, 3, 149.

Flowers blue, August. Alpine meadows.

KANSU: Tangut, *Przewalski*.

SZECHUEN: Ta-chien-lu, *Soulié*, 203; Tongolo, *Soulié*, 313; Kaupai, Tsa-ku-lao, *Rosthorn*, 2516.

12. **Salvia glutinosa,** Linn.; Fl. Brit. Ind. iv, 653.

Flowers purple, September.

SZECHUEN: *Wilson*, 4344 (7000–9000 ft.).

CHEKIANG: Ningpo, *Ford*, 90.

13. **Salvia brevilabra,** Franch. in Bull. Soc. Phil. Par. sér. 8, iii, 3, 149.

S. Blinii, Léveillé in Fedde, Repert. Nov. Sp. ix, 219.

Flowers purple, July.

SZECHUEN: Ta-chien-lu, *Soulié*, 97, *Pratt*, 614, *Wilson*, 4345 (10,000–12,000 ft.).

14. **Salvia digitaloides,** Diels in Notes Bot. Gard. Edin. xxv, 234.

Flowers yellow with pale violet markings, April to May. Dry shady pine forests.

YUNNAN: eastern flank of Lichiang range, Sung-kwei, 8000–9000 ft., *Forrest*, 2031, 5619.

15. **Salvia umbratica,** Hance in Journ. Bot. 1870, 75.

Flowers blue, September to October.

CHILI: Jehol, *David*, 2122; Peking, *Bretschneider*, 593; Taihanling, *Bullock*, 43; *Carles*.

SZECHUEN: Ta-chien-lu, *Hosie*.

16. **Salvia Bulleyana,** Diels in Notes Bot. Gard. Edin. xxv, 233.

S. flava, Forrest ex Diels in Notes Bot. Gard. Edin. xxv, 235.

Flowers yellow to rose, July to August. Stony pastures and shady forest glades.

YUNNAN: Lichiang and Tali ranges at 10,000–12,000 ft., *Forrest*, 602, 2262, 2548, 4545, 4546 (type), 4547, 6079, 6831, 6953, 6988.

17. **Salvia castanea,** Diels in Notes Bot. Gard. Edin. xxv, 233.

Flowers canary-yellow, September. Stony pastures.

YUNNAN: eastern flank of Lichiang range, *Forrest*, 2938.

18. **Salvia plebeia,** R. Br.; Fl. Brit. Ind. iv, 655.

Flowers blue, all the year. Fallow and cultivated fields, and on rocks.

Widely scattered from Chili and Shantung to Yunnan and Kwangtung.

19. **Salvia japonica,** Thunb.*; Fl. Jap., 22.

S. betonicoides, Léveillé in Fedde, Repert. Nov. Sp. viii, 421.

S. tuberifera, Léveillé l.c.

S. Cavaleriei, Léveillé l.c. 422.

S. Delavayi, Léveillé l.c. ix, 220.

S. Prionitis, Hance in Journ. Bot. 1870, 74.

S. scapiformis, Hance l.c. 1885, 368.

S. Piazeskii, Maxim. in Mél. Biol. xi, 304.

S. Fortunei, Benth. in DC. Prodr. xii, 354.

S. chinensis, Benth. l.c. 355.

Flowers blue, red, purple, or rarely white, March to October. Shady places near brooks and on wood borders. Widely distributed in China from Shensi to Yunnan and Kwangtung.

28. **Lophanthus,** Fisch. et Mey.; DC. Prodr. xii, 369.

Lophanthus rugosus, Fisch. et Mey.; DC. Prodr. xii, 369.

Elsholtzia monostachys, Lév. et Vaniot in Fedde, Repert. Nov. Sp. viii, 424.

Flowers pink to rose-purple, May to September. Woods.

KIANGSU: Shanghai, *Faber*.

CHILI: foot of Mt. Conolly, Pekin, *Carles*.

FUKIEN: Buongkang, *Dunn*.

SHENSI: Tu-kia-po, *Giraldi*.

CHEKIANG: Ningpo, *Faber*.

HUPEH: W. Hupeh, *Wilson*, 2508, *Henry*, 424; Ou-tan-scien, *Silvestri*, 2044.

KWEICHOW: Kouy-yang, *Bodinier*, 2486.

YUNNAN: Feng-chen-lin, forests at 7000 ft., *Henry*, 11,215.

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* The species is extremely variable, and many forms have received specific names; but they are so closely connected by the intermediates in the large series now before me, and they are so devoid of any geographical significance, that it appears most reasonable to treat the whole as unispecific. The constant characters are the raceme or panicle of small blue flowers, cylindric calyx, protruded corolla tube, upper straight concave lip, and reflexed 3-lobed lower one. The degree of protrusion of the tube and the stamens is certainly in some cases sexual. The leaves vary through a very wide range; they are even occasionally digitate or pedate through the division of the lower leaflets of a trifoliolate leaf (*Morse*, 4). Hemsley's *var. erythrophylla* has the upper lip shorter and the stamens protruded from earliest anthesis, but the intermediates are numerous.

29. **Nepeta,** Linn. ; Fl. Brit. Ind. iv, 656.

1. Leaves pinnatifid . . . . 2.
Leaves ovate or rotund, crenate or serrate . . . 3.

2. Terminal lobe of leaf large, deeply crenate ; flower twice as long as the calyx . 1. *lavandulacea.*
Terminal and all the lobes linear ; flower exceeding the calyx by one quarter . . 2. *tenuifolia.*

3. Leaves complanate . . . . . 3. *complanata.*
Leaves distichous . . . . 4.

4. Spike of flowers dense, continuous . . . 4. *lamiopsis.*
Flowers in interrupted spikes or distant verticils, or in panicles . . . . . . 5.

5. Flowers few together in the axils of the stem-leaves . . . . . . 5. *Glechoma.*
Flowers in terminal whorled cymes . . . . 6.

6. Corolla tube shorter than the long hair-pointed calyx teeth . . . . . 7.
Corolla tube much longer than the acute (not hair-pointed) calyx teeth . . . . 8.

7. Leaves large, acute . . . . . 6. *Cataria.*
Leaves small, obtuse . . . . . 7. *leucophylla.*

8. Corolla 2 cm. long . . . . . 8. *Everardi.*
Corolla 1 cm. long . . . . . 9. *Fordii.*

1. **Nepeta lavandulacea,** Linn. f. ; DC. Prodr. xii, 370.

N. Vaniotiana, Léveillé in Fedde, Repert. Nov. Sp. ix, 220.

Flowers purple to violet, November. Waste and barren places.

KANSU : *Przewalski.*

KWEICHOW : near Kouy-yang, *Bodinier*, 2011.

2. **Nepeta tenuifolia,** Benth. ; DC. Prodr. xii, 370.

Flowers pale lilac, September.

CHILI : between Pekin and Jehol, *Staunton* ; Pekin, Men-tou-kou, *Carles* ; Pekin, *Bretschneider*, 605, *Skatshkoff*, *Bullock*, 42 ; Jehol, *David*, 2119.

SHENSI : Mt. Miao-nan-san, near Pao-ki-scen, *Giraldi*, 3892.

3. **Nepeta complanata,** Dunn in Notes Bot. Gard. Edin. xxxvii, 122.

Flowers pale purple, July. On scree.

SZECHUEN : 16,000 ft., *Kingdon Ward.*

4. **Nepeta lamiopsis,** Benth. ; Fl. Brit. Ind. iv, 659.

Flowers bright blue, July to August. Grassy rocky slopes.

SZECHUEN: at 9000–11,000 ft., *Wilson*, 4334; Ta-chien-lu, *Pratt*, 472, *Soulié*, 260.

YUNNAN: S.W. China, *Monbeig*; eastern flank of Lichiang range, 11,000–12,000 ft., *Forrest*, 2666.

5. **Nepeta Glechoma,** Benth.; DC. Prodr. xii, 391.

Flowers blue or purple, April to May.

SHANTUNG: Chefoo, *Hancock*, 4; Wei-hai-wei, *Matthew*.

SZECHUEN: W. China, *Wilson*, 4361.

HUPEH: W. Hupeh, *Wilson*, 223, *Henry*, 3840; Ichang, *Henry*, 655, 3397, 3840, 3724, 5259A.

KIANGSU: Shanghai, *Maingay*, 540, *Carles*; Nanking, *Faber*, 912.

CHEKIANG: Hoochow, *Carles*, 162.

KIANGSI: Kewkiang, *Faber*, 585.

FUKIEN: *Dunn*.

YUNNAN: N.W. Yunnan, *Monbeig* 212; Yunnan-sen, *Maire*, 637.

KWANGTUNG: Hongkong (rare), *Hance*, 1146.

6. **Nepeta Cataria,** Linn.; Fl. Brit. Ind. iv, 662.

N. Bodinieri, Vaniot in Bull. Acad. Géogr. Bot. xiv, 172.

Calamintha albiflora, Vaniot l.c. 181.

Flowers white or rose-purple, June to December.

SHANTUNG: Chefoo, *Hance*, 2275 (Swinhoe).

SZECHUEN: *Wilson*, 4386.

HUPEH: Patung, *Henry*, 6156.

KWEICHOW: near Kouy-yang, *Bodinier*, 2030; near Ganpin, *Martin*.

YUNNAN: N.W. Yunnan, *Monbeig*, 213.

7. **Nepeta leucophylla,** Benth.; Fl. Brit. Ind. iv, 662.

YUNNAN: ex Kanitz, *fide* Hemsl.

8. **Nepeta Everardi,** S. Moore in Journ. Bot. 1875, 135.

CHEKIANG: Ningpo, *Everard*.

9. **Nepeta Fordii,** Hemsl. in Journ. Linn. Soc. xxvi, 289.

Flowers blue, April to August.

HUPEH: Ichang and Patung, *Henry*, 1132, 1986, 3978; Sui-fu, *Faber*, 685; above Wan on the river Yangtze, *Faber*, 701; W. Hupeh, *Wilson*, 483.

KWANGTUNG: Lienchow River, *Matthew*.

30. **Dracocephalum,** Linn. ; Fl. Brit. Ind. iv, 664.

1.	Leaves pinnatifid	1. *tanguticum.*
	Leaves entire or toothed	2.
2.	Bracts pectinate, prickly	5.
	Bracts entire or without prickles	3.
3.	Upper calyx tooth ovate, entire	4.
	Upper three teeth combined into a 3-toothed lobe	7.
4.	Leaves linear, entire	2. *Ruyschianum.*
	Leaves ovate, crenate	6.
5.	Floral leaves spinoso-serrate at the base ; flower spike interrupted	3. *Moldavica.*
	Floral leaves crenate at the base ; flower spike dense	4. *heterophyllum.*
6.	Calyx pubescent, teeth acute	5. *speciosum.*
	Calyx asperous, teeth spinose	6. *grandiflorum.*
7.	Flowers few together ; upper leaves stalked, serrate, usually ovate cordate	8.
	Flowers in dense verticils ; upper leaves usually sessile, oblong, finely serrate or crenate, usually truncate or acute at the base	9.
8.	Calyx lobes linear, hair-pointed	7. *Biondianum.*
	Calyx lobes lanceolate acute	8. *urticifolium.*
9.	Middle and upper leaves sessile	10.
	Middle and upper leaves with slender stalks	13.
10.	Bracts lanceolate	11.
	Bracts linear	9. *sibiricum.*
11.	Calyx segments narrow, subulate	10. *Veitchii.*
	Calyx segments narrow-lanceolate	12.
12.	Corolla 2½ times the calyx	11. *Wilsoni.*
	Corolla 1½ times the calyx	12. *coerulescens.*
13.	Corolla 3 times the calyx	13. *Stewartianum.*
	Corolla twice the calyx	14. *tenuiflorum.*

1. **Dracocephalum tanguticum,** Maxim. ; Mél. Biol. xi, 307.

Flowers blue to deep purple, August to September. Stony meadows.

KANSU : *Przewalski.*

SZECHUEN : Tongolo, *Soulié,* 243 ; Ta-chien-lu, *Pratt,* 579 ; W. China, 6000–7000 ft., *Wilson,* 4362.

YUNNAN: eastern flank of Lichiang range at 11,000–12,000 ft.,* *Forrest*, 3033, 6490; Chung-tien plateau, *Forrest*, 604–05 (12,000–13,000 ft.).

2. **Dracocephalum Ruyschianum,** Linn.; DC. Prodr. xii, 401.

Flowers mauve, July. Dry hilly places.

CHILI: Jehol, *David*.

3. **Dracocephalum Moldavica,** Linn.; Fl. Brit. Ind. iv, 665.

D. Fargesii, Léveillé in Fedde, Repert. Nov. Sp. ix, 246.

Flowers blue, August to October. Ditches.

CHILI: Pekin, *Bretschneider, Satow, Hancock*, 62 (2000 ft.); Miao-feng-shan, *Carles*.

KIANGSI: Sarchy (rare), *David*, 2918.

4. **Dracocephalum heterophyllum,** Benth.; Fl. Brit. Ind. iv, 665.

Flowers white.

KANSU: *Przewalski, Hosie, H. F. Ridley*.

5. **Dracocephalum speciosum,** Benth.; Fl. Brit. Ind. iv, 665.

D. bullatum, Forrest ex Diels in Notes Bot. Gard. Edin. xxv, 238.

Flowers dark purplish-blue, July. Limestone drift.

YUNNAN: eastern flank of Lichiang Range at 11,000–12,000 ft., *Forrest*, 6214, 2730.

6. **Dracocephalum grandiflorum,** Linn.; DC. Prodr. xii, 399.

D. rupestre, Hance.

Flowers blue, October. Grassy slopes.

CHILI: Pekin Mountains at 8000 ft., *Hancock*, 6; Miao-feng-shan at 6000 ft.; *Hance*, 14,881, *Carles*; Siao-wu-tai-shan, *Moellendorf*.

7. **Dracocephalum Biondianum,** Diels in Engl. Jahrb. xxxvi, Beibl. 82, 94.

Flowers May.

SHENSI: Kan-y-shan, *Giraldi*, 3930–31.

8. **Dracocephalum urticifolium,** Miq. in Ann. Mus. Bot. Lugd.-Bat. ii, 109.

D. sinense, S. Moore in Journ. Linn. Soc. xiii, 385, t. 16, f. 7.

Flowers blue, purple, or rarely white, March to November. Wet shady places.

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* In the higher altitudes of its range the flowers are larger (up to twice the size of the Tangut types).

Key to Varieties and Forms of Dracocephalum urticifolium.

Leaves ovate, var. **typica**—	
Normal form of type	(1) forma *normalis*.
Flowers racemose	(2) forma *racemosa*.
Stems emitting stolons, which root and flower	(3) forma *radicans*.
Leaves slightly fleshy	(4) forma *carnosa*.
Leaves oblong-lanceolate, var. **angustifolia**—	
Normal form	(5) forma *normalis*.
Flowers racemose	(6) forma *racemosa*.
Stems emitting stolons, which root and flower	(7) forma *radicans*.

(1) var. **typica,** forma **normalis.**

Szechuen : Omi-shan, *Wilson*, 5121.

Hupeh : Hsing-shin, *Wilson*, 1852 ; W. Hupeh, *Wilson*, 323, 2774 ; Chang-yang, *Wilson*, 1129.

Yunnan : Mengtze at 7000 ft., *Hancock*, 24.

(2) var. **typica**, forma **racemosa.**

D. Henryi, Hemsl. in Journ. Linn. Soc. xxvi, 291.

Szechuen : S. Wu-shan, *Wilson*, 1051 ; Pao-kang, *Wilson*, 2280 ; W. China, *Wilson*, 4368, 4370, 4370a, 4371 ; Ta-chien-lu, *Pratt*, 350.

Hupeh : Patung, *Henry*, 1408, 6109, 6109a ; W. Hupeh, *Wilson*, 755, 962.

(3) var. **typica,** forma **radicans.**

Szechuen : Tchen-kou-tin, *Farges*, 1125.

Yunnan : Szemao at 9000 ft., *Henry*.

(4) var. **typica**, forma **carnosa.**

D. Faberii, Hemsl. in Journ. Linn. Soc. xxvi, 291.

Szechuen : Omi-shan, *Faber*, 299, 860–61 (2500–4000 ft.) ; N. Wu-shan, *Henry*, 7041, 7088.

Hupeh : Patung, *Henry*, 4700 ; Paking, *Wilson*, 2565, 2565a.

(5) var. **angustifolia**, forma **normalis.**

D. simplex, Vaniot in Bull. Acad. Géogr. Bot. xiv, 179.

D. *Esquirolii*, Léveillé in Fedde, Repert. Nov. Sp. viii, 422.

D. pinfaense, Léveillé l.c.

Hupeh : Patung, *Henry*, 5330 ; Chang-sha, *Henry*, 6322 ; W. Hupeh, *Wilson*, 595 ; Chien-shi, *Wilson*, 744, 969, 1970, 2774a.

Kiangsi : Kiukiang, *Maries*.

Kweichow : *Esquirol*, 57, *Cavalerie* ; Kouy-yang, *Bodinier*, 2284.

Yunnan : Mengtze, *Henry*, 13,695 ; Yunnan-fu, *Ducloux*, 614.

(6) var. **angustifolia,** forma **racemosa.**

D. stachydifolium, D. kaitchense, and *D. Cavaleriei,* Léveillé in Fedde, Repert. Nov. Sp. viii, 422.

HUPEH : Chienshi, *Henry,* 5798.

KWEICHOW : *Cavalerie,* 1034 ; Kai-chow, *Cavalerie,* 2781 ; Longly, *Cavalerie,* 826.

(7) var. **angustifolia,** forma **radicans.**

KWEICHOW : *Bodinier.*

In the following the determinations of the forms were not noted :—

HUPEH : *Wilson,* 1405.

YUNNAN : eastern flank of Tali range at 9000–10,000 ft., *Forrest,* 7037, 7115, 4536.

9. **Dracocephalum sibiricum,** Linn.

D. Prattii, Leveillé in Fedde, Repert. Nov. Sp. ix, 245.

Nepeta macrantha, Fisch. ; DC. Prodr. xii, 387.

N. Souliei, Léveillé in Fedde, Repert. Nov. Sp. ix, 221.

Flowers blue, September.

KANSU : *Przewalski.*

SZECHUEN : Ta-chien-lu, *Pratt,* 501, *Soulié,* 484, 816 ; W. China at 8000–11,000 ft., *Wilson,* 4363.

10. **Dracocephalum Veitchii,** Dunn in Notes Bot. Gard. Edin. xxxvii, 166.

Nepeta Veitchii, Duthie in Gard. Chron. 1906, ii, 334.

Flowers light blue.

SZECHUEN : *Wilson* ; cultivated by Messrs. Veitch in 1906.

11. **Dracocephalum Wilsoni,** Dunn in Notes Bot. Gard. Edin. xxxvii, 166.

Nepeta Wilsoni, Duthie in Gard. Chron. 1906, ii, 334.

Flowers dark blue with base of corolla yellow, July. Stony pastures.

SZECHUEN : Sung-pan, *Wilson* ; Ta-chien-lu, *Pratt,* 582, *Soulié,* 786 ; Tongolo, *Soulié,* 948.

YUNNAN : eastern flank of Lichiang range, 10,500–11,500 ft., *Forrest,* 2601, 6177.

12. **Dracocephalum coerulescens,** Dunn in Notes Bot. Gard. Edin. xxxvii, 166.

Nepeta coerulescens, Maxim. in Mél. Biol. xi, 306.

KANSU : *Przewalski.*

13. **Dracocephalum Stewartianum,** Dunn in Notes Bot. Gard. Edin. xxxvii, 166.

Nepeta Stewartiana, Diels l.c. xxv, 237.

Flowers blue, July to September. Grassy glades in forest.

SZECHUEN : W. China at 11,000 ft., *Wilson,* 4366.

YUNNAN : eastern flank of Lichiang range, 9000–12,000 ft., *Forrest,* 598, 2960, 6284, 6447.

14. **Dracocephalum tenuiflorum,** Dunn in Notes Bot. Gard. Edin. xxxvii, 166.

Nepeta tenuiflora, Diels l.c. xxv, 237.

Flowers blue, August. Open grassy slopes and glades.

YUNNAN : eastern flank of Lichiang range, 9000–11,000 ft., *Forrest,* 2657.

31. **Scutellaria,** Linn. ; Fl. Brit. Ind. iv, 667.

1. Leaves truncate at the base, or ovate or orbicular . . . . . . 2.
Leaves not truncate at base, linear or oblong, obtuse . . . . . . 19.

2. Leaves truncate at the base, or sinuate or dentate . . . . . . 3.
Leaves cuneate, rounded or cordate at base, crenate or serrate . . . . . . 6.

3. Leaves oblong, obtuse, sinuate-dentate throughout . . . . 1. *scordifolia.*
Leaves ovate or sinuate-dentate only below . . . . 4.

4. Leaves sinuate dentate throughout ; flowers subtended by short bracts . . . . 5.
Leaves sinuate-dentate in their lower third part ; flowers subtended by leafy bracts ; racemes terminal . . 2. *rivularis.*

5. Racemes axillary . . . . 3. *Franchetiana.*
Racemes terminal . . . . . . 4. *sp.*

6. Racemes axillary . . . . . . 7.
Racemes terminal . . . . . . 8.

7. Leaves stalked . . . . 5. *angulosa.*
Leaves sessile . . . . 6. *sessilifolia.*

8. Leaves mostly radical . . . 7. *Tayloriana.*
Leaves at flowering time all cauline . . . 9.

9. Leaves cuneate or rounded at base, entire or sinuate . . . . . . 10.
Leaves truncate or cordate at base . . . . 15.

10.	Leaves reticulate beneath, rounded at top	8. *obtusifolia.*
	Leaves with veins not prominently netted beneath	11.
11.	Leaves densely pubescent beneath	12.
	Leaves glabrous	14.
12.	Leaves entire or coarsely serrate	9. *javanica.*
	Leaves sinuate-dentate	13.
13.	Leaves conspicuously 3-nerved	10. *trinervata.**
	Leaves penni-nerved	4. *Vaniotiana.** 5724
14.	Leaves less than 5 cm. long	11. *stenosiphon.**
	Leaves over 10 cm. long	12. *yunnanensis.*
15.	Petiole more than ¼ of blade	16.
	Petiole less than ¼ of blade	18.
16.	Leaves usually orbicular, obtuse, less than 2.5 cm. long	17.
	Leaves elliptic, over 5 cm. long	13. *discolor.*
17.	Racemes long and terminal	14. *indica.*
	Racemes on short lateral branches	15. *Wongkei.*
18.	Leaves acute	16. *cyrtopoda.*
	Leaves obtuse	17. *Forrestii.*
19.	Leaves oblong-elliptic, blunt	20.
	Leaves linear-oblong, entire	24.
20.	Leaves bidentate, distinctly stalked	21.
	Leaves entire or crenate, subsessile	22.
21.	Flowers viscid-hairy; leaves obtuse	18. *sciaphila.*
	Flowers glabrous	19. *laxa.*
22.	Flowers axillary; root fibrous	20. *strigillosa.*
	Flowers racemose; root woody	23.
23.	Flowers blue	21. *amoena.*
	Flowers yellow	22. *likiangensis.*
24.	Leaves viscid-hairy	23. *viscidula.*
	Leaves glabrous or subglabrous	24. *macrantha.*

1. **Scutellaria scordifolia,** Fisch.; DC. Prodr. xii, 425.

Flowers light blue, June to July. Rocky places.

CHILI: Jehol, *David*; Hun-ho (River), Pekin (rare), *Hancock*, 82.

SHANTUNG: Chefoo, *Hancock*, 13, *Dunn*; Wei-hai-wei, *Matthew*, *Dunn*.

KANSU: *H. F. Ridley*.

2. **Scutellaria rivularis,** Wall.; Fl. Brit. Ind. iv, 670.

S. Cavaleriei, Léveillé et Vaniot in Fedde, Repert. Nov. Sp. viii. 402.

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* Nos. 4, 10, and 11 may prove to be the same species.

Flowers blue to brilliant purple, April to October. Ditches, paddy bunds, and wet banks.

SZECHUEN : Omi, *Faber*.

HUPEH : Ichang, *Henry*, 480, 273, 886, *Wilson*, 390, 1127, 1387.

KIANGSU : Chiukiang, *Carles*, 441.

CHEKIANG : *Hickin* ; Ningpo, *Cooper*.

KIANGSI : Kewkiang, *Bullock*, 214, *Reid*, 8, *Carles*, 214.

FUKIEN : Yenping, *Dunn*.

KWEICHOW : Gan-pin, *Cavalerie*, 2105.

YUNNAN : Szemao, W. forests, *Henry*, 11,919, 11,919A (5000 ft.).

KWANGTUNG : Macao, *Callery*, 184 ; Sai-chu-shan (Sampson), *Hance*, 10,910 ; Lienchow River, *Matthew* ; Wu-king-fu, *Dalziel* ; Swatow, *Dunn* ; Suikong, *B. C. Henry*.

HAINAN : Kiung-chou, *Ford*, 461.

3. **Scutellaria Franchetiana,** Léveillé in Fedde, Repert. Nov. Sp. ix, 221.

Flowers red, April to June. Sides of rivulets.

SZECHUEN : Omi, *Wilson*, 5122 ; Tchen-kou at 3600 ft., *Farges*, 1133.

HUPEH : *Henry*, 3559, 3559A ; S. Patung, *Henry*, 6087 ; Nanto, *Wilson*, 1211.

FUKIEN : Foochow, *Carles*, 612 ; Buong-kang (Yenping), Dunn, *Hongkong Herb.*, 3415.

4. **Scutellaria, sp.***

Flowers pale violet, July.

KWEICHOW : Yang-kia Tchang, *Esquirol*, 291.

5. **Scutellaria angulosa,** Benth. ; Fl. Brit. Ind. iv, 669.

Flowers white, June, July. Sides of streams.

HUPEH : Fang, *Wilson*, 2227, 2389.

6. **Scutellaria sessilifolia,** Hemsl. in Journ. Linn. Soc. xxvi, 297.

S. Delavayi, Léveillé in Fedde, Repert. Nov. Sp. ix, 221.

Flowers pale yellow, June to August. Woods.

SZECHUEN : Omi at 4000–9000 ft., *Faber*, 119, *Wilson*, 5129.

YUNNAN : Tchen-fong-chan, *Delavay*, 5122.

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* This species has been named by Léveillé in honour of Vaniot, but as no description has been so far seen the *nomen nudum* is withheld.

7. **Scutellaria Tayloriana,** Dunn in Notes Bot. Gard. Edin. xxxvii, 166.

Flowers blue, March.

YUNNAN: *Ducloux*, 429; Yunnan-sen, *Maire*, 1630, 2178, 2265, 2294, 2531.

KWANGTUNG: Tai-mo-shan, Hongkong, *Ford*, 107; Lantao, *Tutcher.*

8. **Scutellaria obtusifolia,** Hemsl. in Journ. Linn. Soc. xxvi, 296.

Flowers blue, June.

SZECHUEN: Omi, *Faber*, 746, 871 (types), 3500, *Wilson*, 5131; Min River, *Wilson*, 4356.

HUPEH: Ichang, *Henry*, 4208 (type).

9. **Scutellaria javanica,** Jungh.

S. formosana,* N. E. Br. in Gard. Chron. 1894, ii, 212.

Flowers blue, July.

KWANGTUNG: Lantao.

HAINAN: Tai-ün, *Ford*, 462.

10. **Scutellaria trinervata,** Vaniot in Bull. Acad. Géogr. Bot. xiv, 189.

Flowers June.

KWEICHOW: Tou-chan, *Bodinier.*

11. **Scutellaria stenosiphon,** Hemsl. in Journ. Linn. Soc. xxvi, 297.

Flowers July.

KWANGTUNG: Lo-fou-shan, *Ford.*

12. **Scutellaria yunnanensis,** Léveillé in Fedde, Repert. Nov. Sp. ix, 221.

Flowers rosy, May. Shady places.

SZECHUEN: Omi, *Wilson*, 209, 4355, 4360–61, 5714.

YUNNAN: Lou-ki, *Delavay*, 4983.

13. **Scutellaria discolor,** Colebr.; Fl. Brit. Ind. iv, 667.

Flowers purple. Ravines in forest.

YUNNAN: Mi-lê forests at 5000 ft., *Henry*, 10,458; Feng-chen-lin, south of Red River at 7000 ft., *Henry*, 10,657; Szemao at 4000 ft., *Henry*, 12,368, 12,368A.

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* N. E. Brown received the plant which he called *S. formosana* from Veitch in 1894, and supposed that it came from Formosa. But it is very probable that it originated in the Hongkong Botanic Garden, to which it was introduced from Hainan and where it flowered abundantly at about that time.

14. **Scutellaria indica,** Linn.; DC. Prodr. xii, 417.

Flowers blue to purple, sometimes with a violet-like perfume. Common on grassy hillsides at low and moderate elevations in most provinces of China.

15. **Scutellaria Wongkei,** Dunn in Kew Bull. 1914, 329.

Flowers blue, August.

KWANGTUNG: Shun-ling, Sze-tse-shan, *Wong-ke*.

16. **Scutellaria cyrtopoda,** Miq. Fl. Brit. Ind. ii, 973.

Flowers pink.

YUNNAN: Mengtze at 8000 ft., *Henry*, 10,240.

17. **Scutellaria Forrestii,** Diels in Notes Bot. Gard. Edin. xxv, 239.

Flowers deep purple. Limestone rocks.

YUNNAN: eastern flank of Lichiang range at 11,000 ft., *Forrest*, 2281, 5705.

18. **Scutellaria sciaphila,** S. Moore in Journ. Bot. 1875, 228.

Flowers purple, May. Wheat-fields.

KIANGSI: Kewkiang, *Shearer* (type), *Bullock*, 215.

19. **Scutellaria laxa,** Dunn in Notes Bot. Gard. Edin. xxxvii, 166.

Flowers pale purple, February.

YUNNAN: Feng-chen-lin at 8000 ft., *Henry*, 13,771.

20. **Scutellaria strigillosa,** Hemsl. in Journ. Linn. Soc. xxvi, 297.

Flowers light blue.

SHANTUNG: Chefoo, *Perry*.

21. **Scutellaria amoena,** Wright in Kew Bull. 1896, 164.

S. tuberosa, Vaniot in Bull. Acad. Géogr. Bot. xiv, 188.

S. hypericifolia, Léveillé in Fedde, Repert. Nov. Sp. ix, 221.

Flowers bright blue, purple, or rose-lavender, March to August. Dry, arid, and stony pastures.

SZECHUEN: Ta-chien-lu, *Wilson*, 4357, *Soulié*, 526, *Pratt*, 580, 703 (types); Sangpan at 10,000, *Wilson*, 4358, 4359.

YUNNAN: Yunnan-sen, *Maire*, 213, 1467, 1794, 2301; Tse-kou, *Monbeig*, 216; eastern flank of Lichiang range, 9000–11,000 ft., *Forrest*, 2083, 4541, 5728, 7147 (Tali range, 8000–9000 ft.), 607 (Chung-tien plateau at 13,000 ft.); Mengtze, 6000–7000 ft., *Henry*, 10,560, *Hancock*, 2; mountains from Ma-ke to Le-kong-tsien, *Bodinier*.

22. **Scutellaria likiangensis,** Diels in Notes Bot. Gard. Edin. xxv, 239.

Flowers dull yellow, June. Dry open situations among scrub.

Yunnan: eastern flank of Lichiang range, *Forrest*, 2424, 6003.

23. **Scutellaria viscidula,** Bunge; DC. Prodr. xii, 424.

Chili: N. China, *Bunge*; Pekin to Jehol, *Staunton*; Pekin, *Skatschkoff.*

Shantung: Chefoo, *Stuhlmann.*

24. **Scutellaria macrantha,** Fisch.; DC. Prodr. xii, 424.

S. baicalensis, Georgi, It. 223.

Flowers deep blue to purple, July to November. Grassy hills, sandy moors.

Chili: Great Wall, *Bunge*; N. China (Moellendorf), *Hance*, 11,426; Pekin, *Williams, Hancock*, 16, *Satow, Bretschneider*, 587–88, *Bushell, Hemeling, Carles*, 163.

Shantung: *Maingay*, 112; Chefoo, *Hancock*, 33, *Faber*, 127, *Fortune*, 16.

Yunnan: Yunnan-sen, *Maire*, 86, 2183; Mengtze, 5000–6000 ft., *Hancock*, 69, *Henry*, 13,772.

32. **Prunella,** Linn.; Fl. Brit. Ind. iv, 670.

Prunella vulgaris, Linn.; Fl. Brit. Ind. iv, 670.

Flowers purple, June. Grassy banks.

Frequent in the less elevated districts of China from Shantung to Yunnan.

33. **Chelonopsis,** Miq.; Benth. et Hook. Gen. Pl. ii, 1204.

1. Leaf-blade more than 4 cm. long, closely crenate-serrate 2
Leaf-blade under 3 cm., coarsely irregularly biserrate . . . . . 1. *Giraldii.*

2. Petiole less than $\frac{1}{4}$ of blade . . . . . 3.
Petiole $\frac{1}{3}$ of blade . . . . . 2. *odontochila.*

3. Leaves sessile, narrow-lanceolate . . . 3. *deflexa.*
Leaves petioled, ovate . . . . 4. *moschata.*

1. **Chelonopsis Giraldii,** Diels in Engl. Jahrb. xxxvi, Beibl. 82, 94.

Flowers August to October.

Shensi: Tai-pa-shan, *Giraldi*, 1233; Miao-wang-shan, *Giraldi*, 5585.

2. **Chelonopsis odontochila,** Diels in Notes Bot. Gard. Edin. xxv, 240.

Flowers yellow, October.

YUNNAN: valley of Yangtze between Tse-kou and Shi-ku at 6000–7000 ft., *Forrest*, 22, 600.

3. **Chelonopsis deflexa,** Diels in Engl. Jahrb. xxix, 554.

C. Benthamiana, Hemsl. in Journ. Linn. Soc. xxvi, 298.

Bostrychanthera deflexa, Benth. et Hook. Gen. Pl. ii, 1216.

HUPEH: Chien-shih, *Henry*, 7325 (type).

FUKIEN: Amoy, *Swinhoe* (type).

4. **Chelonopsis moschata,** Miq.; Mél. Biol. ix, 443.

KIANGSI: Ningpo (Faber), *Hongkong Herb.* 73.

34. **Marrubium,** Linn.; Fl. Brit. Ind. iv, 671.

Marrubium incisum, Benth.; DC. Prodr. xii, 447.

Flowers white, March to April. Weed in fields.

CHILI: Pekin, *Bretschneider*, 594, *Bushell, Bunge, Carles, Hemeling*; Tchao-tchao, *Chanet*.

HUPEH: W. Hupeh, *Wilson*, 1756; Ichang, *Henry*, 1233; Yangtze River, *Faber*, 704.

KIANGSU: Chinkiang, *Carles*.

KIANGSI: Ningpo, *Everard*.

YUNNAN: Mengtze plain, *Henry*; Yunnan-sen, *Maire*, 1473, 1625, 2161; Yunnan-fu and Tali, 6000–7000 ft., *Forrest*, 594, 4957.

35. **Craniotome,** Reichb.; Fl. Brit. Ind. iv, 671.

Craniotome versicolor, Reichb.; Fl. Brit. Ind. iv, 671.

Flowers pink. Mountain woods.

YUNNAN: Mengtze on S.E. mts. at 7000 ft., *Henry*, 9162, 11,251; Yunnan-sen, *Maire*, 745, 1169, 1581.

36. **Anisomeles,** Br.; Fl. Brit. Ind. iv, 672.

Anisomeles ovata, Br.; Fl. Brit. Ind. iv, 672.

Flowers pink, August. Grassy and waste places.

HUPEH: Nanto, *Henry*, 4442.

FUKIEN: Amoy, *Dunn*.

YUNNAN: Mengtze, *Hancock*, 324, *Henry*, 10,149, 10,149A.

KWANGTUNG: *Ford*, 143, *Fortune*, 140, *Millett*, *Seeman*, 2439; Swatow, *Dalziel*, *Dunn*; Hongkong, Little Hongkong, *Wilford*, 214, *Wright*, 389; Macao, *Callery*, 141, *Meyen*; Danes'

Island, *W. Brown*; Pakhoi, *Playfair*, 97; Hoi-fung, *Lo Quai*; Plover Cove, Hongkong, *Mrs. Gibbs*.

HAINAN: Sam-shan-sze, *Dunn's Chinese collector*.

37. **Colquhounia,** Wall.; Fl. Brit. Ind. iv, 674.

Hairs on leaves and flowers stellate . . .	1. *coccinea*.
Hairs simple	2. *elegans*.

1. **Colquhounia coccinea,** Wall.; Fl. Brit. Ind. iv, 674.

Flowers of a soft rose, July. Dry stony places and on cliffs.

YUNNAN: eastern flank of Tali range at 6500–7000 ft., *Forrest*, 620, 627, 4533, 6889, 7120.

2. **Colquhounia elegans,** Wall.; Fl. Brit. Ind. iv, 674.

Flowers red, pink, orange, or brown, March, December. Woods.

Key to Varieties of C. elegans.

Flowers in loose few-flowered axillary heads; corolla tube very short, throat wide . .	var. *pauciflora*.
Flowers in loose many-flowered long axillary racemes; corolla tube very long, throat narrowed	var. *tenuiflora*.

var. **pauciflora,** Prain in Journ. As. Soc. Beng. lxii, 38.

C. Seguini, Vaniot in Bull. Acad. Géogr. Bot. xiv, 165.

C. decora, Diels * in Notes Bot. Gard. Edin. xxv, 240.

HUPEH: Ichang, *Henry*, 3334, 3334A (types), 4089.

KWEICHOW: Ou-la-gay and Hoang-ko-chou, *Bodinier*, 2237.

YUNNAN: Ko-chin Range, 6000–7000 ft., *Hancock*, 452; Mengtze, *Henry*, 9089, 9089A and B; Shek-ping, *Henry*, 11,582; Yunnan-sen, *Maire*, 1221; hills west of Yunnan-fu, *Forrest*, 327A.

var. **tenuiflora,** Prain l.c.

YUNNAN: Szemao at 5000 ft., *Henry*, 12,607A and B.

38. **Stachys,** Linn.; Fl. Brit. Ind. iv, 675.

1.	Stem with plentiful deflexed needle-like hairs . .	2.
	Stem glabrous or with spreading or soft hairs . .	3.
2.	Flowers less than twice the calyx; leaves linear, subsessile . . .	1. *chinensis*.
	Flowers twice as long as the calyx; leaves shortly stalked	2. *aspera*.

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* Diels writes (l.c.) that Henry's n. 3334, which is Prain's type of *C. elegans* var. *pauciflora*, is quite different from *C. decora*, Diels, having much smaller flowers. When Diels' and Prain's type specimens are compared, the flowers are, however, seen to be exactly the same size.

3.	Calyx teeth blunt callous	3. *adulterina.*
	Calyx teeth acute or bristle-pointed	4.
4.	Calyx teeth ovate	5.
	Calyx teeth linear	4. *leptodon.*
5.	Leaves cordate ovate stalked	5. *kouyangensis.*
	Leaves oblong or linear-oblong	6.
6.	Corolla scarcely longer than the calyx; flowers axillary	6. *arvensis.*
	Corolla much exserted	7.
7.	Leaves densely velvety beneath	7. *oblongifolia.*
	Leaves glabrous or pubescent	8. *palustris.*

1. **Stachys chinensis,** Bunge; DC. Prodr. xii, 471.

S. Chanetii, Léveillé in Fedde, Repert. Nov. Sp. ix, 222.

Flowers purple, May. Ditches.

CHILI: N. China, *Bunge*; Peking, *Bretschneider*, 604; Ting-tcheou, *Chanet*, 407.

2. **Stachys aspera,** Michx.; DC. Prodr. xii, 471.

CHILI: Jehol, *David*; Pekin, *Skatschkoff*, *David*, 9418.

SHANSI: Pei-shan, *David*.

3. **Stachys adulterina,** Hemsl.* in Journ. Linn. Soc. xxvi, 300.

Flowers red, pink, or white, July.

SZECHUEN: S. Wu-shan, *Wilson*, 1380; Changyang, *Wilson*, 1541.

HUPEH: *Henry*, 2459, 6192; Patung, *Henry*, 4676 (types).

4. **Stachys leptodon,** Dunn in Notes Bot. Gard. Edin. xxxvii, 167.

Flowers purple.

YUNNAN: Yunnan-sen, *Maire*, 88, 182, 1591, 2022.

5. **Stachys kouyangensis,** Dunn in Notes Bot. Gard. Edin. xxxvii, 167.

S. Franchetiana,† Léveillé in Fedde, Repert. Nov. Sp. ix, 246.

S. cordifolia, Prain in Journ. As. Soc. Beng. lix, ii, 310, *not of* C. Kock.

S. cardiaphylla, Prain ex Dunn.

Lamium kouyangense, Vaniot in Bull. Acad. Géogr. Bot. xiv, 175 (1904).

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* *S. adulterina* and *oblongifolia* may prove to be but marked forms of *S. palustris*.

† The type of Léveillé's *S. Franchetiana*—one of Pratt's Ta-chien-lu specimens—is not the same form as Prain's S. Yunnan plant, which is the commonest one in S.W. China, and has more cordate and more deeply crenate leaves.

Flowers pink, July to September. Grassy mountain slopes.

Szechuen : Ta-chien-lu at 9000–13,500 ft., *Pratt*, 500, *Soulié*, 448 ; Tongolo, *Soulié*, 727.

Hupeh : Nanto, *Henry*, 4615 (cult.) ; Chien-shih, *Henry*, 5913 ; S. Patung, *Henry*, 7316.

Kweichow, *Bodinier*, 1700 (type).

Yunnan : Momein, *Anderson* ; Mengtze at 7000 ft., *Henry*, 10,074, 10,074a, 10,074b, *Ducloux*, 158, *Maire*, 781, 1614, 2370, 2485 ; eastern flank of Tali range at 10,000 ft., *Forrest*, 861, 2483, 4539, 6828, 6828a.

6. **Stachys arvensis,** Linn. ; DC. Prodr. xii, 477.

Flowers pale purple, May to July. Cultivated fields.

Fukien : Yuen-fu River shores, *Dunn*.

Kwangtung : Wu-king-fu, *Dalziel* ; Han banks, Swatow, *Dunn*.

7. **Stachys oblongifolia,** Benth. ; Fl. Brit. Ind. iv, 676.

S. Martini, Vaniot in Bull. Acad. Géogr. Bot. xiv, 187.

S. modica, Hance in Journ. Bot. 1882, 92.

Flowers pink or purple, May to October. Fallow fields.

Szechuen : *Parker*.

Hupeh : Ichang, *Henry*, 560, 2003 (Nanto), 3514, 5943 ; Ichang, *Wilson*, 458.

Ganwhai : Wuhu, *Carles, Bullock*.

Kiangsi : Kewkiang, *Shearer*.

Kweichow : Tchen-lin-tcheou (Martin), *Bodinier*, 1945.

8. **Stachys palustris,** Linn. ; Fl. Brit. Ind. iv, 676.

Flowers pale purple, April to July. Marshes and corn-fields.

Chili : N. China, *Bunge* ; Pekin, *Bretschneider*, 595.

Hupeh : *Wilson*, 796 (Nanto) ; Fang, *Wilson*, 2367.

Anhui—Ganwhai : Wuhu, *Carles*.

Kiangsu : Shanghai (Faber), *Hongkong Herb*. 37, *Maingay*, 343, 542, *Forbes*.

Chekiang : *Hickin*.

Fukien : Foochow, *Carles*, 748, 901.

Yunnan : Tali range, 7000–8000 ft., *Forrest*, 4523.

Kwangtung : W. River, *Ford*.

39. **Galeopsis,** Linn. ; DC. Prodr. xii, 498.

Galeopsis Tetrahit, Linn. ; DC. Prodr. xii, 497.

Flowers white, October. Open pastures.

SZECHUEN: Ta-chien-lu, *Pratt*, 113, *Soulié*, 218; Tongolo, *Soulié*, 237; Omi at 10,800 ft., *Wilson*, 4327.

YUNNAN: eastern flank of Lichiang range at 11,000 ft., *Forrest*, 6476.

40. **Leonurus**, Linn.; Fl. Brit. Ind. iv, 677.

Leaves much dissected	1. *sibiricus.*
Leaves few-lobed or entire	2. *macranthus.**

1. **Leonurus sibiricus**, Linn.; Fl. Brit. Ind. iv, 678.

Flowers pink, May to August. Damp open places and waste ground. Widely distributed in China from Chili and Szechuen to Kwangtung, Hainan, and Yunnan.

2. **Leonurus macranthus**, Maxim.; Mél. Biol. ix, 445.

Flowers white, August to September.

SHANTUNG: *Williams*; Wei-hai-wei, *Matthew*; Chefoo, *Faber*, 112, *Forbes*, *Maingay*, 22; Tsingtau, *Dunn*, *Schindler*.

HUPEH: Fang at 9000–10,000 ft., *Wilson*, 2612.

KIANGSU: Chinkiang, *Carles*, 508.

41. **Lamium**, Linn.; Fl. Brit. Ind. iv, 677.

1.	Floral leaves sessile	1. *amplexicaule.*
	Floral leaves stalked	2.
2.	Lowest whorl of flowers shorter than the petiole	2. *Foliatum.*
	Lowest whorl exceeding the petiole	3.
3.	Lowest floral leaves oblong, cuneate	3. *chinense.*
	Lowest floral leaves ovate, cordate	4. *album.*

1. **Lamium amplexicaule**, Linn.; Fl. Brit. Ind. iv, 679.

Flowers pink, March to September. Fields and banks.

HUPEH: *Wilson*, 120.

KIANGSU: Shanghai, *Carles*, *Faber*.

CHEKIANG: Hoochow, *Carles*.

YUNNAN: Tsekou, *Monbeig*, 215; Lunan, *Henry*, 10,585; Yunnan-sen, *Maire*, 181, 636, 1292, 2043; Tali valley and Lichiang valley at 6000–9000 ft., *Forrest*, 2046, 4540, 4964.

2. **Lamium foliatum**, Dunn in Journ. Linn. Soc. xxxviii, 363.

Flowers pale purple or white, May. Woods.

FUKIEN: Buong-kang, Yenping (Dunn), *Hongkong Herb.* 3427.

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* *L. macranthus* is represented in China by a well-marked form with the deeply-lobed lower leaves velvety beneath and upper leaves entire.

3. **Lamium chinense,** Benth. ; DC. Prodr. xii, 512.

Stachys hupehensis, Pamp. in Bull. Soc. Bot. Ital. 1911, 176.

Flowers pink, April.

HUPEH : Ichang, *Henry,* 1182 ; Chang-yang, *Henry,* 5220, *Wilson,* 201, 211, 4350 (Yangtze River) ; *Silvestri,* 3369, 3369A.

CHEKIANG : Pu-to Is., *Henry,* 31 ; Ningpo, *Everard* ; Tien-tai mountains, *Faber,* 302.

FUKIEN : Foochow, *Carles,* 746, 904, *Dunn.**

KIANGSI : Kewkiang, *Shearer.*

KWANGTUNG : West River, *Ford.*

4. **Lamium album,** Linn. ; Fl. Brit. Ind. iv, 679.

Flowers white, April to May.

HUPEH : W. Hupeh, *Wilson,* 588.

KIANGSU : Shanghai, Quinsan, *Carles* ; Mei-chi, *Carles,* 165.

KIANGSI : Kewkiang, *Faber,* 695.

42. **Paralamium,** Dunn in Notes Bot. Gard. Edin. xxxvii, 168.

Paralamium gracile, Dunn l.c.

Flowers purple. Forests.

YUNNAN : S.E. of Mengtze at 6000 ft., *Henry,* 10,636.

43. **Loxocalyx,** Hemsl. in Journ. Linn. Soc. xxvi, 308.

Loxocalyx urticifolius, Hemsl. l.c. 309.

Flowers pink. Forests.

SZECHUEN : S. Wu-shan, *Henry,* 7266.

HUPEH : Hsingshan, *Henry,* 6482 ; Fang, 7000–9000 ft., *Henry,* 6795.

YUNNAN : Mengtze, *Henry,* 10,237.

44. **Leucas,** Br. ; Fl. Brit. Ind. iv, 680.

1. Leaves linear, entire ; calyx very oblique . . . 1. *lavandulaefolia.*
   Leaves lanceolate or ovate, crenate . . . . . 2.

2. Leaves densely woolly or silky . . . . . 3.
   Leaves subglabrous . . . . 4.

3. Calyx white, woolly . . . . . 2. *mollissima.*
   Calyx pubescent . . . . . 3. *lanata.*

4. Stem subglabrous . . . . . 4. *zeylanica.*
   Stem densely hirsute . . . . . 5. *ciliata.*

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* The species as found by me along the banks of the Yuen-fu River near Foochow was a weed in sandy vegetable fields.

1. **Leucas lavandulaefolia,** Sm.
L. linifolia, Spreng. ; Fl. Brit. Ind. iv, 690.
Flowers white, July. Sea sands.
KWANGTUNG : Hongkong, Saiwan Bay (Bodinier), *Hongkong Herb.* 605.

2. **Leucas mollissima,** Wall. ; Fl. Brit. Ind. iv, 682.
Flowers white, December. Dry hills and banks.
SZECHUEN : Chung-king, *Faber*, 702.
HUPEH : Ichang, Nanto, *Henry*, 2349, 2599 ; *Wilson*, 379.
YUNNAN : Mengtze and Szemao, *Henry*, 10,029, 10,029A.
KWANGSI : Lungchow, *Morse*, 229.
FUKIEN : Amoy, *Dunn*.
KWANGTUNG : Hongkong, *Wright*, 391, *Hinds*, *Champion*, 458 ; Swatow, *Dunn*.
HAINAN : *Henry*, 8114 ; Tingan, *Katsumata*.

3. **Leucas lanata,** Benth. ; Fl. Brit. Ind. iv, 681.
HAINAN : West coast, Hoi-tow (Fagg), *Hance*, 8782.

4. **Leucas zeylanica,** R. Br. ; Fl. Brit. Ind. iv, 689.
Flowers white, March to December. River banks.
KWANGTUNG : Swatow, *Dalziel*, *Dunn*.
HAINAN : *Carles*, *Henry*, 8509, *U On* ; Hoi-tow, *Hance*, 12,816.

5. **Leucas ciliata,** Benth. ; Fl. Brit. Ind. iv, 687.
Flowers white or yellowish, July to October. Dry grassy mountains.
YUNNAN : *Ducloux*, 166, *Maire*, 1580, 1605 ; Mengtze, 5000 ft., *Henry*, 10,292, 10,292A ; Teng-yueh at 6000 ft., *Forrest*, 1021 ; eastern flank of Tali range at 7000–9000 ft., *Forrest*, 4537.

45. **Phlomis,** Linn. ; Fl. Brit. Ind. iv, 691.

1.	Leaves rosulate ; plant acaulescent	1. *rotata*.
	Leaves on the stem	2
2.	Leaves all narrowed or rounded at the base	3.
	Leaves (at least the lower ones) cordate	5.
3.	Tube of the corolla nearly twice the calyx	2. *albiflora*.
	Tube of the corolla hardly exserted	4.
4.	Flowers in the axils of the upper leaves	3. *gracilis*.
	Flowers mostly below the leaves	4. *rugosa*.
5.	Bracts less than ⅔ of calyx	6.
	Bracts as long as the calyx	11.

6.	Calyx teeth gradually acuminate	5. *umbrosa*.*
	Calyx teeth subulate	7.
7.	Plant tall, branched	8.
	Plant small, unbranched	6. *medicinalis*.
8.	Plant glabrous or nearly so	7. *Forrestii*.
	Plant uniformly pubescent	9.
9.	Bracts ligulate, branched	5. *umbrosa*.*
	Bracts filiform, simple	10.
10.	Bracts very short; leaf-stalks shorter than their blades	8. *Franchetiana*.
	Bracts ½ the calyx; leaf-stalks longer than their blades	9. *tatsiensis*.
11.	Calyx more than 1.8 cm. long	10. *megalantha*.
	Calyx less than 1.5 cm. long	12.
12.	Annual; whole plant softly tomentose	11. *dentosa*.
	Perennial; leaves very rarely tomentose	13.
13.	Leaves straight-sided from a broad base to a narrow apex	12. *tuberosa*.
	Leaves ovate	14.
14.	Leaves mostly radical, glabrous, blunt	13. *atropurpurea*.
	Stem leafy	15.
15.	Flowers dark purple	14. *bracteosa*.*
	Flowers white or pale pink	5. *umbrosa*.*

1. **Phlomis rotata,** Benth.; Fl. Brit. Ind. iv, 694.

On scree.

YUNNAN: N.W. Yunnan at 14,000–15,000 ft., *Kingdon-Ward*.

2. **Phlomis albiflora,** Hemsl. in Journ. Linn. Soc. xxvi, 304.

Flowers white, May.

HUPEH: Ichang, Nanto, *Henry*, 720, 1575, 1910, 3576 (types), *Wilson*, 83.

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* The forms which have been referred to *P. bracteosa* and *P. umbrosa* constitute a nearly complete series between these two species, and it may be that they actually indicate the uni-specific nature of the group. Many forms have been described, and many more might be added, for the shape and pubescence of the leaves, the length and shape of the bracts, vary, giving characters which combine in an infinite number of permutations. *P. bracteosa*, Royle, may be described as (1) the Indian and S.W. Chinese member of the group; *P. melanantha*, Diels (differing from typical *P. bracteosa* in its narrower more pungent bracts, but here regarded as conspecific), as occupying (2) a rather more northerly area (N. Yunnan and E. Tibet); Hemsley's var. *australis* of *P. umbrosa* as the (3) west-central Chinese representative; while typical *P. umbrosa*, Turcz., occupies (4) the northern provinces: the two latter differ from the former in their pale purple or white flowers, and *P. umbrosa* var. *australis* differs from them in its shorter, stiffer and wider bracts.

3. **Phlomis gracilis,** Hemsl in Journ. Linn. Soc. xxvi, 305.

Flowers white.

HUPEH: Nanto, *Henry*, 2089; Ichang, *Henry*, 4111 (types).

4. **Phlomis rugosa,** Benth.; Fl. Brit. Ind. iv, 693.

Lamium coronatum, Van. in Bull. Acad. Géogr. Bot. xiv, 174.

Loxocalyx Vaniotiana, Léveillé in Fedde, Repert. Nov. Sp. ix, 224.

Flowers yellow, May to August. Woods.

SZECHUEN: Yangtze River, *Faber*, 691; Mt. Omi, *Wilson*, 5119.

KWEICHOW: Gan-pin, *Martin et Bodinier*; Long-ly, *Cavalerie.*

YUNNAN: Mengtze at 6000 ft., *Henry*, 10,076, 10,076A (Feng-chen-lin), 11,445; Szemao at 4000 ft., *Henry*, 12,599.

KWANGTUNG: *Ford*, 138; Lienchow River, *Matthew*; west of Mt. Parker, Hongkong, *Tutcher*.

5. **Phlomis umbrosa,** Turcz.; DC. Prodr. xii, 544.

P. stenocalyx, Diels in Engl. Jahrb. xxix, 555.

Flowers white or pale pink, July to September. Shady forests.

CHILI: Pekin, *Burchell*; Po-hua-shan, *Bullock, Bretschneider.*

SHANTUNG: Chefoo, *Faber*, 113.

SZECHUEN: Ta-chien-lu, *Pratt*, 173, 473; Mt. Omi, *Wilson*, 5112; Pao-kang at 7000–9000 ft., *Wilson*, 2492 (?); W. China, *Wilson*, 4335, 4335A.

HUPEH: *Wilson*, 1054, 1452, 4337–38; Ichang and Patung, *Henry*, 875, 1872, 2442, 6029, 6179, 6432, 7360; Outanshan at 7000 ft., *Silvestri*, 2072; Fanpien Mt., *Silvestri*, 2069.

KIANGSU: Chinkiang, *Carles*, 512.

YUNNAN: valleys of Mekong-Salween, 6000–8000 ft., *Forrest*, 621; eastern flank of Lichiang range at 10,000–11,000 ft., *Forrest*, 2489, 6100.

6. **Phlomis medicinalis,** Diels in Engl. Jahrb. xxix, 554.

Flowers July.

SZECHUEN: Tsa-ku-lao, *Rosthorn*, 2530.

7. **Phlomis Forrestii,** Diels in Notes Bot. Gard. Edin. xxv, 241.

Flowers dull livid crimson, August. Among scrub and on margins of pine forests.

YUNNAN: eastern flank of Tali range at 9000–11,000 ft., *Forrest*, 4558A.

8. **Phlomis Franchetiana,** Diels in Notes Bot. Gard. Edin. xxv, 242.

Flowers dull livid crimson, August. Among scrub in and on the margins of pine forests.

YUNNAN: eastern flank of Tali range at 9000–11,000 ft., *Forrest*, 4558.

9. **Phlomis tatsiensis,** Bur. et Franch. in Journ. de Bot. v, 149.

P. Souliei, Léveillé in Fedde, Repert. Nov. Sp. ix, 222.

SZECHUEN: Ta-chien-lu, *Soulié*, 188, 867; W. China, *Bulley*.

10. **Phlomis megalantha,** Diels in Engl. Jahrb. xxxvi, Beibl. lxxxii, 95.

Flowers yellow, July.

SZECHUEN: Ta-chien-lu, *Pratt*, 505.

HUPEH: Fang, *Wilson*, 2406.

11. **Phlomis dentosa,** Franch. Pl. David. i, 243.

Flowers, June.

CHILI:- Sarchy, *David*, 2731.

12. **Phlomis tuberosa,** Linn.; DC. Prodr. xii, 544.

P. betonicoides, Diels in Notes Bot. Gard. Edin. xxv, 241.

Flowers purple-violet, June. Stony cultivated ground.

CHILI: Siao-tai-shan, Pekin at 3600–5000 ft., *Moellendorf*; Ourato, Sarchy, *David*, 2770.

YUNNAN: northern end of Lichiang valley, 9000 ft., *Forrest*, 2307, 5974.

13. **Phlomis atropurpurea,** Dunn in Notes Bot. Gard. Edin. xxxvii, 169.

Flowers dull purplish maroon, August. Open pastures.

YUNNAN: eastern flank of Lichiang range at 11,000–12,000 ft., *Forrest*, 6262.

14. **Phlomis bracteosa,** Royle; Fl. Brit. Ind. iv, 693.

P. setifera, Bur. et Franch. in Journ. de Bot. v, 149.

P. melanantha, Diels in Notes Bot. Gard. Edin. xxv, 242.

Flowers mauve to almost black, July. Open grassy places.

SZECHUEN: Ta-chien-lu, *Bonvalot et Pr. Henri*.

YUNNAN: Mengtze, W. and N. mts. at 7000–8000 ft., *Henry*, 10,216, 10,216A; eastern flank of Lichiang range at 10,000–11,000 ft., *Forrest*, 2540.

46. **Eriophyton,** Benth. ; Fl. Brit. Ind. iv, 695.

Eriophyton Wallichianum, Benth. ; Fl. Brit. Ind. iv, 695.

Flowers pale rose, September. Limestone rocks.

YUNNAN : eastern flank of Lichiang range at 13,000–14,000 ft., *Forrest,* 2909, 6248.

47. **Microtoena,** Prain in Hook. Ic. Pl. xix, t. 1872.

1. Calyx with acuminate subulate teeth . . . . 2.
Calyx with narrow-lanceolate or triangular teeth . . . . 3.

2. Bracts ovate ; calyx teeth equal . . . 1. *Prainiana.*
Bracts filiform ; upper calyx tooth much longer than the others . . . . 2. *urticifolia.*

3. Upper calyx tooth twice the others, ligulate (not subulate) . . . . . 3. *Delavayi.*
Upper calyx tooth about equal to the others . . 4.

4. Mid-lobe of the corolla lip ligulate ; calyx teeth triangular . . . . 4. *insuavis.*
Mid-lobe ovate . . . . . . 5.

5. Calyx teeth narrow-lanceolate . . . 5. *moupinensis.*
Calyx teeth oblong . . . . . 6. *robusta.*

1. **Microtoena Prainiana,** Diels in Engl. Jahrb. xxix, 556.

Flowers yellow (?), September.

SZECHUEN : Nan-chuan, *Rosthorn,* 788.

2. **Microtoena urticifolia,** Hemsl. in Journ. Linn. Soc. xxvi, 308.

Flowers yellow or white, July and August.

SZECHUEN : W. China, *Wilson,* 4372 ; Paokang, *Wilson,* 2499.

HUPEH : Patung, *Henry,* 2536, 7339.

3. **Microtoena Delavayi,** Prain in Bull. Soc. Bot. Fr. xlii, 424.

Flowers yellow, July to August. Dry shady places.

HUPEH : Paokang, *Wilson,* 2502.

YUNNAN : *Ducloux,* 757 ; Teng-yueh, *Howell,* 136 ; eastern slope of Salween valley at 4000–5000 ft., *Forrest,* 1040.

4. **Microtoena insuavis,** Prain.

M. cymosa, Prain in Hook. Ic. Pl. xix, t. 1872.

M. Esquirolii and *mollis,* Léveillé in Fedde, Repert. Nov. Sp. ix, 222.

Gomphostemma insuave, Hance.

Flowers yellow or reddish, March to October. Ravines and woods.

KWEICHOW: Lo-fou, *Cavalerie*, 3548; Kiao-tsong, *Esquirol*, 155; Tchen-fong, *Esquirol*, 672.

YUNNAN: Mengtze, *Henry*, 9850; Shih-ping, *Henry*, 11,583; Szemao, *Henry*, 12,588.

KWANGTUNG: Shiu-kwan River, *Lo Quai*.

5. **Microtoena moupinensis,** Franch. ex Prain in Bull. Soc. Bot. Fr. xlii, 426.

Flowers purple. Pastures and wood borders.

SZECHUEN: Moupine, *David*.

6. **Microtoena robusta,** Hemsl. in Journ. Linn. Soc. xxvi, 307.

Flowers pink. Woods.

HUPEH: Hsing-shan, *Henry*, 6482A; Fang, *Henry*, 7631.

48. **Gomphostemma,** Wall.; Fl. Brit. Ind. iv, 696.

1.	Calyx hardly ribbed	2.
	Calyx strongly ribbed	5.
2.	Tube of corolla straight, lips small	3.
	Tube incurved, lips large	4.
3.	Flowers in bracteate racemes	1. *microdon*.
	Flowers in cymes	2. *parviflorum*.
4.	Corolla tube only slightly exceeding the calyx	3. *pedunculatum*.
	Corolla tube much longer than the calyx	4. *chinense*.
5.	Calyx teeth small subulate	5. *lucidum*.
	Calyx teeth lanceolate, longer than the tube	6. *leptodon*.

1. **Gomphostemma microdon,** Dunn in Notes Bot. Gard. Edin. xxxvii, 170.

YUNNAN: Szemao, W. forests at 4500 ft., *Henry*, 12,501.

2. **Gomphostemma parviflorum,** Wall.; Fl. Brit. Ind. iv, 697.

Flowers yellow.

YUNNAN: Szemao, E. mts., *Henry*, 12,253.

3. **Gomphostemma pedunculatum,** Benth.; Fl. Brit. Ind. iv, 696.

Flowers reddish, yellowish, or white.

YUNNAN: *Henry*, 12,518, 12,518A (Szemao), 13,594 (Yuan-chang).

4. **Gomphostemma chinense,** Oliv. in Hook. Ic. Pl. t. 1468.
Flowers white, June.
FUKIEN: Amoy, *Swinhoe.*
KWEICHOW: *Cavalerie.*
KWANGTUNG: Lo-fou-shan, *Ford*; N.W. River, *Ford.*

5. **Gomphostemma lucidum,** Wall.; Fl. Brit. Ind. iv, 697.
Flowers white to pale yellow, July.
YUNNAN: Mengtze and Szemao, *Henry,* 11,046, 12,011, 12,011A, 12,307, 12,314, 12,609.
HAINAN: Hong-ta, *Ford,* 464.

6. **Gomphostemma leptodon,** Dunn in Notes Bot. Gard. Edin. xxxvii, 170.
Flowers February. Among bushes.
KWANGSI: Achin Mts., Lung-chow, *Morse,* 257.

49. **Eurysolen,** Prain in Sci. Mem. Medic. Offic. Ind. xi, 43.

Eurysolen gracilis, Prain l.c. 44.
Flowers whitish. Forests.
YUNNAN: Szemao, *Henry,* 12,913.

50. **Amethystea,** Linn.

Amethystea coerulea, Linn.; DC. Prodr. xii, 372.

Flowers deep blue, June to September. Dry waste ground, walls, pastures.

CHILI: Jehol, *David,* 2064; Tcheng-ling-fu, *Chanet.*
HUPEH: Nanto, *Henry,* 4488.
YUNNAN: Mekong valley from 5600–7000 ft., *Forrest,* 93; eastern flank of Lichiang range at 8200 ft., *Forrest,* 2485, 6232.

51. **Teucrium,** Linn.; Fl. Brit. Ind. iv, 700.

1. Leaves usually trifid . . . . . 1. *palmatum.*
Leaves only serrate . . . . 2.

2. Calyx about equally 5-toothed; flowers paniculate . . . . 3.
Calyx bilabiate, upper lobe broad rounded . . . 4.

3. Whole plant densely yellowish-silky-hairy; leaves usually cordate, shortly stalked . 2. *quadrifarium.*
Plant glabrous or pubescent; leaves usually acute at the very base with slender stalks . . . . . 3. *japonicum.*

4. Raceme simple, terminal; side lobes of corolla coherent with the posterior one; lower lobes of calyx separate . . . . 4. *simplex.*
Racemes mostly axillary . . . . . . 5.

5. Lobes of fully expanded corolla shorter than the exserted part of the corolla tube . . 5. *ornatum.*
Lobes of fully expanded corolla longer than the exserted part of the corolla tube . . . 6.

6. Lower teeth of the calyx coherent nearly to the top . . . . . 6. *bidentatum.*
Lower teeth free . . . . . 7. *Pernyi.*

1. **Teucrium palmatum,** Benth. in Fl. Brit. Ind. iv, 702.

HUPEH: Fang, 8000 ft., *Henry*, 6844.
YUNNAN: *Forrest*, 6591.

2. **Teucrium quadrifarium,** Ham.; Fl. Brit. Ind. iv, 701.

T. fulvo-aureum, kouytchense, Léveillé in Fedde, Repert. Nov. Sp. viii, 426.

Flowers rose-lilac, July to November. Dry open grass land.

HUPEH: Chien-shih, *Henry*, 7422; Patung, *Wilson*, 1412.
HUNAN: Shi-men, *Henry*, 7938.
KIANGSU: Shanghai, *Faber.*
KWEICHOW: *Esquirol*, 765; Kouy-yang, *Bodinier et Martin*, 1735; Pin-fa, *Cavalerie.*
YUNNAN: Mengtze, *Hancock*, 103, *Henry*, 9845, 11,047; Tengyueh, *Howell*; La-fo-wa-di, Salwen at 3000 ft., *Forrest*, 1068.
KWANGTUNG: Hongkong, *Wilford*, 215 (Peak), *Champion*, *Wright*, 392, *Hance*, 901.

3. **Teucrium japonicum,** Willd.; DC. Prodr. xii, 581.

T. nepetoides, Léveillé in Fedde, Repert. Nov. Sp. viii, 450.

Flowers pink, April to October.

SZECHUEN: W. China, *Wilson*, 4353 (4000 ft.).
HUPEH: Tung-hu, *Henry*, 6406; Patung, *Henry*, 5191, 7328; Ichang, *Henry*, 515, 941, 6672.
KWEICHOW: Pin-fa, *Cavalerie.*
CHEKIANG: Ningpo (Faber), *Hongkong Herb.* 66, 67, 335.
KWANGTUNG: Chao-chau-fu, *Dalziel*; Lo-fou-shan, *Millett*, *Ford*, 147; Shingmun, Hongkong, *Tutcher*; Victoria Peak, *Ford.*
HAINAN: *Henry*, 8735, *Carles*; Tingan, *Katsumata.*

4. **Teucrium simplex,** Van. in Bull. Acad. Géogr. Bot. xiv, 186.

Flowers white. Mountain pastures.

YUNNAN: *Ducloux*, 749; Mengtze at 5500 ft., *Henry*, 10,068.

5. **Teucrium ornatum,** Hemsl. in Journ. Linn. Soc. xxvi, 313.

T. Franchetianum, Diels in Engl. Jahrb. xxix, 551.

Ornithosiphon Delavayi, Léveillé in Fedde, Repert. Nov. Sp. ix, 218.

Flowers rose-pink, July to October. Woods.

SZECHUEN : *Rosthorn*, 2188 ; W. China at 4000 ft., *Wilson*, 4354.

HUPEH : in woods near Patung, *Henry*, 5141 ; Tung-hu, *Henry*, 6437 ; Hsing-shan, *Henry*, 6471 ; Fang, *Henry*, 6700 ; W. Hupeh, *Wilson*, 423A, 1451.

YUNNAN : Tseng-fong-chan, *Delavay*, 5051.

6. **Teucrium bidentatum,** Hemsl. in Journ. Linn. Soc. xxvi, 312.

Flowers white, August.

SZECHUEN : Omi, *Faber*, 676, *Wilson*, 5128.

HUPEH : Ichang, Antelope Glen, *Henry*, 3119, 4150.

7. **Teucrium Pernyi,** Franch. ; Pl. David. 245.

T. alborubrum, Hemsl. in Journ. Linn. Soc. xxvi, 311.

T. Ningpoense, Hemsl. l.c. 313 ; Dunn in Notes Bot. Gard. Edin. xxxvii, 170.

Flowers pale yellow or white, September. Woods.

SZECHUEN : S. Wushan, *Henry*, 7227.

HUPEH : *Henry*, 4257 ; Ichang, *Henry*, 2919 ; Nanto, *Henry*, 4600.

CHEKIANG : Ningpo mountains (Faber), *Hongkong Herb.* 63, 336.

KIANGSI : Kewkiang, Lushan (mountains), *Bullock*, 63, *Carles*.

YUNNAN : Mengtze at 6000 ft., *Henry*, 10,986.

52. **Leucosceptrum,** Sm. ; Fl. Brit. Ind. iv, 699.

Leaves rounded at base	1. *sinense*.
Leaves acute at base	2. *canum*.

1. **Leucosceptrum sinense,** Hemsl. in Journ. Linn. Soc. xxvi, 310.

L. Bodinieri, Léveillé in Fedde, Repert. Nov. Sp. ix, 224.

Elsholtzia Cavaleriei, Léveillé, l.c. viii, 424.

Flowers rose, September. On cliffs.

HUPEH : Chang-yang, *Henry*, 7765.

KWEICHOW : Tsin-gay, *Bodinier*, 2709 ; Tou-chan, *Cavalerie*, 2710.

2. **Leucosceptrum canum,** Sm.; Fl. Brit. Ind. iv, 699.

Flowers rose-crimson, September. Shady river banks and forests.

YUNNAN: Yang-pi valley at 7000 ft., *Forrest*, 923; Mengtze, 6000 ft., *Henry*, 9397 & A.

53. **Ajuga,** Linn.; Fl. Brit. Ind. iv, 702.

1.	Corolla tube geniculate near the base	2.
	Corolla tube straight	3.
2.	Calyx teeth short, obtuse	1. *macrosperma.**
	Calyx teeth long, acute	2. *decumbens.*
3.	Corolla tube 2–3 times longer than the limb	4.
	Corolla tube less than half as long again as the limb	6.
4.	Corolla tube 4 times as long as the calyx	3. *ovalifolia.*
	Corolla tube less than twice as long as the calyx	5.
5.	Plant stoloniferous; stem densely pubescent	4. *campylantha.*
	Stolons 0; stem subglabrous	5. *lupulina.*
6.	Spike compact	7.
	Spike interrupted	8.
7.	Leaves oblong, sessile; bracts much exceeding the flowers	6. *Forrestii.*
	Leaves ovate, stalked; bracts shorter than the flowers	7. *ciliata.*
8.	Leaves linear	8. *linearifolia.*
	Leaves spathulate	9.
9.	Leaves membranous, not in a rosette	9. *genevensis.*†
	Lower leaves oblong spathulate in a rosette, subcoriaceous	10. *remota.*

1. **Ajuga macrosperma,** Wall.; Fl. Brit. Ind. iv, 703.

Flowers blue, April. Mountain streams, wet places in woods.

YUNNAN: Mengtze, *Hancock*, 183 (5000–6000 ft.), *Henry*, 10,900; Man-pan, south of Red River at 4000 ft., *Henry*, 10,364; Szemao, *Henry*, 11,684, 11,684A, B, C.

2. **Ajuga decumbens,** Thunb.; DC. Prodr. xii, 598.

Flowers white with a blue calyx, April to June. Dry stony ground.

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* Maximowicz distinguished *A. macrosperma* from *A. decumbens*, the only other curved-tubed species recorded from China, by its large branching habit. Some of the Indian and all the Chinese specimens seen by me which have the characteristic short blunt calyx teeth are slender, prostrate, or ascending plants.

† The leaves of the Chinese forms of *A. genevensis* vary as they do in Europe, being sessile and oblong on the upper part, stalked and spathulate on the lower part, of the stem.

HUPEH: Ichang, *Henry*, 770, 814, 1213; Nanto, *Henry*, 3837.

KIANGSU: Shanghai, *Carles*, 351.

FUKIEN: Amoy, *Hance*, 1430; Kuling, *Dunn*.

YUNNAN: Tali valley and eastern flank of Tali range at 6700–9000 ft., *Forrest*, 4525.

KWANGTUNG: Canton, *Hance*, 1430.

3. **Ajuga ovalifolia,** Bur. et Franch. in Journ. de Bot. v, 150.

Flowers August. Mountain pastures.

SZECHUEN: Ta-chien-lu, *Soulié*, 819, *Pratt*, 249, 479, *Wilson*, 4331, 4331A.

4. **Ajuga campylantha,** Diels in Notes Bot. Gard. Edin. xxv, 243.

Flowers white, veined with purplish black, August. Dry stony pastures.

YUNNAN: northern end of Lichiang plain at 8500 ft., *Forrest*, 2700.

5. **Ajuga lupulina,** Maxim. in Mél. Biol. ix, 831, xi, 811.

Flowers a watery transparent blue, veined with darker blue, or sometimes yellow, June to September. Mountain pastures.

CHILI: Shao-ho-ling Pass, Pekin, *Moellendorf*, 92; Pekin at 6500 ft., *Hancock*, 1.

KANSU: Alps south of Lake Kuku Nor, *Przewalski*.

SZECHUEN: Sung-pan, *Wilson*, 4332; Ta-chien-lu, *Pratt*, 565; Tongolo, *Soulié*, 944.

YUNNAN: eastern flank of Lichiang range at 10,000–11,000 ft., *Forrest*, 2448, 6000.

6. **Ajuga Forrestii,** Diels in Notes Bot. Gard. Edin. xxv, 242.

Flowers pale blue, May to September. Dry stony fields.

SZECHUEN: W. China at 12,000 ft., *Wilson*, 4333; Ta-chien-lu, *Pratt*, 506.

YUNNAN: Tse-kou, *Monbeig*, 217; northern end of Lichiang valley at 8500–9000 ft., *Forrest*, 596, 2133.

7. **Ajuga ciliata,** Bunge; DC. Prodr. xii, 596.

A. Chaneti, Léveillé et Van. in Fedde Repert. Nov. Sp. viii, 258.

Flowers white, July. Wet places.

CHILI: Kiu-yang, *Chanet*, 311; Pekin, *Bushell*; N. China, *Bunge* (type).

SHANSI: Lao-y-san, *Giraldi*.

SZECHUEN: W. China at 11,000 ft., *Wilson*, 4325.

HUPEH: Fang, *Wilson*, 2338; *Henry*, 6038, 6038A (Chienshih), 6285 (Chung-lo).

8. **Ajuga linearifolia,** Pamp. in Nuov. Giorn. Bot. Ital., 1910, 703.

Flowers March.

HUPEH: Ou-kia-ki, *Silvestri*, 2001.

9. **Ajuga genevensis,** Linn.; DC. Prodr. xii, 596.

A. Argyi, Léveillé.

A. Labordei, Van. in Bull. Acad. Géogr. Bot. xiv, 185.

Flowers white or mauve, March to August. Stony places. Widely distributed from Hupeh and Szechuen to Kwangtung and Yunnan.

10. **Ajuga remota,** Benth.; DC. Prodr. xii, 598.

Flowers lilac to white, March to July. Dry stony pastures.

YUNNAN: eastern flank of Tali range at 9000 ft., *Forrest*, 4524, 7280; Yunnan-sen, *Maire*, 783, 2422; Mengtze at 4500 ft., *Henry*, 10,861, *Hancock*, 163.

COLLECTORS' NUMBERS.

Bodinier.

144. Salvia miltiorrhiza.
1504. S. yunnanensis.
1533. S. yunnanensis.
1700. Stachys kouyangensis.
1941. Calamintha Clinopodium.
1942. Plectranthus sculponiatus.
1944. Elsholtzia polystachya.
1945. Stachys oblongifolia.
1946. Dysophylla linearis
2011. Nepeta lavandulacea.
2030. Nepeta Cataria.
2237. Colquhounia elegans.
2284. Dracocephalum urticifolium.
2480. Plectranthus striatus.
2486. Lophanthus rugosus.
2547. Elsholtzia Bodinieri.
2669. Mosla chinensis.
2711. Elsholtzia rugulosa.

Bourne.

2. Perilla avium.
34. Elsholtzia rugulosa.
169. Ajuga genevensis.

Bretschneider.

77. Elsholtzia Stauntoni.
576. E. cristata.
577. Perilla avium.
578–9. Mentha arvensis.
583. Lycopus europaeus.
585. Calamintha Clinopodium.
586. Salvia miltiorrhiza.
587–8. Scutellaria macrantha.
589. Scutellaria indica.
593. Salvia umbratica.
594. Marrubium incisum.
595. Stachys palustris.
596. Leonurus sibiricus.
598. Lycopus lucidus.
600. Plectranthus glaucocalyx.
604. Stachys chinensis.

Brown.

12. Leonurus sibiricus.
13. Prunella vulgaris.
97. Salvia plebeia.

Bullock.

43. Salvia umbratica.
63. Teucrium Pernyi.
214. Scutellaria rivularis.
215. Scutellaria sciaphylla.
343. Elsholtzia cristata.

Callery.

141. Anisomeles ovata.
158. Perilla nankinensis.
184. Scutellaria rivularis.

Carles.

15. Perilla nankinensis.
77. Dysophylla cruciata.
114. Salvia plebeia.
158. S. japonica.
159–60. S. miltiorrhiza.
161. Scutellaria indica.
162. Nepeta Glechoma.
163. Scutellaria macrantha.
164. Leonurus sibiricus.
165. Lamium album.
225–6. Mosla lanceolata.
333. Thymus serpyllum.
343. Elsholtzia cristata.
347. Plectranthus nervosus.
348. Perilla nankinensis.
351. Ajuga decumbens.
352. A. genevensis.
353. Salvia plebeia.
354. Calamintha gracilis.
355. C. Clinopodium.
406. Elsholtzia cristata.
441. Scutellaria rivularis.
442–3. Ajuga genevensis.
478. Origanum vulgare.
508. Leonurus macranthus.
512. Phlomis umbrosa.
611. Calamintha gracilis.
612. Scutellaria Franchetiana.
670. Salvia japonica.
679. Plectranthus amethystoides.
690. Mentha arvensis.
725. Mosla chinensis.
733. Perilla avium.
734. Plectranthus macrocalyx.
736. Mosla dianthera.
746. Lamium chinense.
748. Stachys palustris.
772. Mosla lanceolata.
901. Stachys palustris.
904. Lamium chinense.

Cavalerie.

362. Plectranthus Prainianus.
363. P. macranthus.
488. Melissa parviflora.
530. Mosla Cavaleriei.
587. Plectranthus nervosus.
824. Salvia japonica.
826, 1034. Dracocephalum urticifolium.
1426. Elsholtzia communis.
1821. Salvia japonica.
1933. Mentha Malinvaldi.
2105. Scutellaria rivularis.
2480. Lycopus europaeus.
2743. Salvia japonica.
2781. Dracocephalum urticifolium.
3778. Micromeria biflora.

Champion.

225. Scutellaria indica.
226. Salvia japonica.
339. Pogostemon Championi.
458. Leucas mollissima.

Chanet.

311. Ajuga ciliata.
407. Stachys chinensis.
546. Salvia miltiorrhiza.

Couling.

22, 31. Salvia miltiorrhiza.

David.

2064. Amethystea coerulea.
2122. Salvia umbraticola.
2770. Phlomis tuberosa.
2731. Phlomis dentosa.
2918. Dracocephalum Moldavica.
9418. Stachys aspera.

Delavay.

5156. Salvia japonica.

Ducloux.

8. Calamintha gracilis.
17. Orthosiphon rubicundus.
82. Prunella vulgaris.
105. Origanum vulgare.
116. Melissa parviflora.
141. Ajuga genevensis.
158. Stachys kouyangensis.
159. Salvia yunnanensis.
166. Leucas ciliata.
208. Mentha arvensis.
220. Plectranthus sculponiatus.
266. P. striatus.
274. P. angustifolius.
429. Scutellaria Tayloriana.
464. S. indica.
509. Elsholtzia communis.
510. E. kachinensis.
512. Ocimum basilicum.
520. Elsholtzia flava.
554. Plectranthus striatus.
565. Elsholtzia polystachya.
580. E. pilosa.
614. Dracocephalum urticifolium.
703. Salvia japonica.
749. Teucrium simplex.
757. Microtoena Delavayi.

Esquirol.

57. Dracocephalum urticifolium.
155. Dysophylla verticillata.
214. Plectranthus striatus.
291. Scutellaria sp.
572. Salvia yunnanensis.
834. Plectranthus Cavaleriei.
1058. Coleus Esquirolii.

Faber.

61, 81. Mosla lanceolata.
112. Leonurus macranthus.
113. Phlomis umbrosa.
116. Mosla dianthera.
119. Scutellaria sessilifolia.
127. S. macrantha.
299. Dracocephalum urticifolium.
302. Lamium chinense.
304. Calamintha gracilis.
334. Mosla lanceolata.
666. Hancea sinensis.
676. Teucrium bidentatum.
681. Hancea sinensis.
683. Salvia plebeia.
689. S. japonica.
691. Phlomis rugosa.
694. Ajuga genevensis.
695. Lamium album.
697. Salvia japonica.
700. Scutellaria indica.
702. Leucas mollissima.
704. Marrubium vulgare.
705. Ajuga genevensis.
707. Salvia plebeia.
746. Scutellaria obtusifolia.
799. Salvia japonica.
860–1. Dracocephalum urticifolium.
871. Scutellaria obtusifolia.
1710. Mosla lanceolata.

Farges.

31. Salvia Maximowicziana.
1033. Scutellaria angulosa.
1125. Dracocephalum urticifolium.

Forbes.

19. Calamintha Clinopodium.

Ford.

3. Dysophylla auricularia.
24. Microtoena insuavis ?
25. Plectranthus nervosus.
30. Mosla lanceolata.
40. M. dianthera.
47. Plectranthus striatus.

Ford—*continued.*

73. Hyptis suaveolens.
90. Salvia glutinosa.
107. Scutellaria Tayloriana *and* Coleus carnosifolius.
138. Phlomis rugosa.
140. Ocimum basilicum.
143. Anisomeles ovata.
146. Salvia japonica *and* Orthosiphon marmoritis.
147. Teucrium japonicum.
325. Salvia japonica.
457. Nosema prunelloides.
459. Plectranthus Stracheyi.
460. Orthosiphon stamineus.
461. Scutellaria rivularis.
462. S. javanica.
464. Gomphostemma lucidum.
550. Orthosiphon stamineus.

Forrest.

18. Plectranthus striatus.
22. Chelonopsis odontochila.
65. Salvia trijuga.
93. Amethystea coerulea.
126. Orthosiphon rubicundus.
327A. Colquhounia coccinea.
523. Elsholtzia flava.
582. Acrocephalus fruticosus.
583. Elsholtzia pilosa.
584. Calamintha Clinopodium.
585. Elsholtzia kachinensis.
586. E. Bodinieri.
587. Plectranthus eriocalyx.
588. Elsholtzia pilosa.
594. Marrubium incisum.
595. Plectranthus phyllopodus.
596. Ajuga Forrestii.
597. Plectranthus sculponiatus.
598. Dracocephalum Stewartianum.
600. Chelonopsis odontochila.
602. Salvia Bulleyana.
604–5. Dracocephalum tanguticum.
607. Scutellaria amoena.
620. Colquhounia coccinea.
621. Phlomis umbrosa.
622. Elsholtzia cristata.
624. Plectranthus phyllostachys.
625. Elsholtzia luteola.
627. Colquhounia coccinea.
628. Elsholtzia communis.
630. E. rugulosa.
640. Dracocephalum tanguticum.
830. Elsholtzia communis.
831. E. communis.
861. Stachys kouyangensis.
871. Perilla avium.
875. Pogostemon Dielsianus.
878. Elsholtzia rugulosa.
897. Plectranthus megathyrsus.
923. Leucosceptrum canum.
934. Elsholtzia heterophylla.
946. E. kachinensis.
947. E. pilosa.
961. Plectranthus macranthus.
1007. P. ternifolius.
1021. Leucas ciliata.
1035. Elsholtzia rugulosa.
1040. Microtoena Delavayi.
1043. Plectranthus ternifolius.
1068. Teucrium quadrifarium.
2031. Salvia digitaloides.
2046. Lamium amplexicaule.
2047. Salvia yunnanensis.
2083. Scutellaria amoena.
2133. Ajuga Forrestii.
2262. Salvia Bulleyana.
2281. Scutellaria Forrestii.
2285. Prunella vulgaris.
2307. Phlomis tuberosa.
2309 & A. Calamintha Clinopodium.
2333. Plectranthus pleiophyllus.
2394. Salvia campanulata.
2424. Scutellaria likiangensis.
2448. Ajuga lupulina.
2476. Calamintha Clinopodium.
2483. Stachys kouyangensis.
2485. Amethystea coerulea.
2489. Phlomis umbrosa.
2507. Plectranthus irroratus.
2524. Leonurus sibiricus.
2528. Origanum vulgare.
2540. Phlomis bracteosa.
2548. Salvia Bulleyana.
2559. Mentha arvensis.
2560. M. arvensis.
2564. Plectranthus oreophilus.
2601. Dracocephalum Wilsoni.
2657. D. tenuiflorum.
2666. Nepeta lamiopsis.
2681. Elsholtzia polystachya.
2700. Ajuga campylantha.
2730. Dracocephalum speciosum.
2813. Salvia trijuga.
2851. Plectranthus Forrestii.
2909. Eriophyton Wallichianum
2919. Salvia hians.
2938. S. castanea.
2960. Dracocephalum Stewartianum.
3033. D. tanguticum.
4522. Calamintha Clinopodium.

Forrest—*continued.*

4523. Stachys palustris.
4524. Ajuga remota.
4525. A. decumbens.
4526. Prunella vulgaris.
4527–9. Calamintha Clinopodium.
4530. Lophanthus rugosus.
4531. Mentha arvensis.
4532. Origanum vulgare.
4533. Colquhounia coccinea.
4534. Leonurus sibiricus.
4536. Dracocephalum urticifolium.
4537. Leucas ciliata.
4538. Melissa parviflora.
4539. Stachys kouyangensis.
4540. Lamium amplexicaule.
4541. Scutellaria amoena.
4542. Salvia plebeia.
4543. S. yunnanensis.
4544. S. japonica.
4545–7. S. Bulleyana.
4548. S. campanulata.
4554. Plectranthus Bulleyanus.
4555–6. P. phyllopodus.
4557. P. adenanthus.
4558. P. Franchetiana.
4558A. Phlomis Forrestii.
4693. Elsholtzia flava.
4694. E. polystachya.
4759. E. polystachya.
4957. Marrubium incisum.
4964. Lamium amplexicaule.
5584. Orthosiphon rubicundus.
5619. Salvia digitaloides.
5678. S. campanulata.
5705. Scutellaria Forrestii.
5728. S. amoena.
5754. Salvia hians.
5756. Prunella vulgaris.
5767. Origanum vulgare.
5811. Salvia hians.
5970. S. hians.
5974. Phlomis tuberosa.
6000. Ajuga lupulina.
6003. Scutellaria likiangensis.
6079. Salvia Bulleyana.
6100. Phlomis umbrosa.
6143. Plectranthus irroratus.
6177. Dracocephalum Wilsoni.
6207. Plectranthus oreophilus.
6214. Dracocephalum speciosum.
6232. Amethystea coerulea.
6243. Plectranthus Forrestii.
6248. Eriophyton Wallichianum.
6262. Phlomis atropurpurea.
6283. Elsholtzia flava.
6284. Dracocephalum Stewartianum.
6313. Plectranthus pleiophyllus.
6322. Calamintha Clinopodium.
6333. Elsholtzia polystachya.
6345. Plectranthus sculponiatus.
6394. P. phyllostachys.
6395. P. pleiophyllus.
6447. Dracocephalum Stewartianum.
6462. Plectranthus Forrestii.
6476. Galeopsis Tetrahit.
6490. Dracocephalum tanguticum.
6527. Elsholtzia rugulosa.
6549. E. polystachya.
6562. Salvia trijuga.
6583. Leonurus sibiricus.
6591. Teucrium palmatum.
6603. Plectranthus pleiophyllus.
6617. Elsholtzia polystachya.
6680. E. pilosa.
6699. E. cristata.
6718. E. polystachya.
6729. E. kachinensis.
6820. Plectranthus striatus.
6828 & A. Stachys kouyangensis.
6831. Salvia Bulleyana.
6869. Elsholtzia rugulosa.
6889. Colquhounia coccinea.
6897. Mentha arvensis.
6953. Salvia Bulleyana.
6988. S. Bulleyana.
7037. Dracocephalum urticifolium.
7042. Elsholtzia kachinensis.
7115. Dracocephalum urticifolium.
7120. Colquhounia coccinea.
7147. Scutellaria amoena.
7195. Elsholtzia kachinensis.
7209. E. heterophylla.
7220. E. Myosurus.
7248. Salvia yunnanensis.
7280. Ajuga remota.
7283. Salvia plebeia.
7286. Melissa parviflora.
7371. Elsholtzia Bodinieri.

Fortune.

11. Elsholtzia cristata.
A13. Scutellaria rivularis.
15. S. macrantha.
A80. Ajuga genevensis.
82. Salvia japonica.
A83. Lamium chinense.
A90. Calamintha Clinopodium.
A91. Prunella vulgaris.
103. Salvia japonica.
A109. Stachys palustris.
140. Anisomeles ovata.
156. Ajuga genevensis.
168. Scutellaria indica.
173. Leonurus sibiricus.

Giraldi.

597. Elsholtzia communis.

Hance.

616. Leonurus sibiricus.
745. Plectranthus ternifolius.
901. Teucrium quadrifarium.
1427. Salvia japonica.
1430. Ajuga decumbens *and* A. genevensis.
1431. A. genevensis.
1483. Calamintha Clinopodium.
1484. Mosla lanceolata.
1485. Hyptis suaveolens.
2982. Mentha arvensis.
6514. Salvia miltiorrhiza.
6546. Perilla nankinensis.
7103. Thymus Serpyllum.
7489. Calamintha gracilis.
7581. C. Clinopodium.
8782. Leucas mollissima.
10,190. Scutellaria rivularis.
10,531. Plectranthus amethystoides.
11,426. Scutellaria macrantha.
11,432. Salvia miltiorrhiza.
11,448. Dysophylla verticillata.
12,816. Leucas zeylanica.
13,045. Calamintha gracilis.
14,608. Elsholtzia Stauntoni.
14,881. Dracocephalum grandiflorum.
15,511. Salvia japonica.
20,307. Dysophylla cruciata.
22,288. Mosla dianthera.

Hancock.

2. Scutellaria amoena.
6. Dracocephalum grandiflorum.
13. Scutellaria scordifolia.
16. S. macrantha.
23. Prunella vulgaris.
24. Dracocephalum urticifolium.
26. Salvia plebeia.
33. Scutellaria macrantha.
44. Salvia miltiorrhiza.
60. Scutellaria indica.
61. Salvia yunnanensis.
62. Dracocephalum Moldavica.
66. Orthosiphon rubicundus.
69. Scutellaria macrantha.
73. Plectranthus eriocalyx.
75. Plectranthus glaucocalyx.
82. Scutellaria scordifolia.
103. Teucrium quadrifarium.
163. Ajuga remota.
183. A. macrosperma.
207. Lycopus lucidus.
209. Origanum vulgare.
230. Elsholtzia communis.
235. Coleus Esquirolii.
248. Colebrookia oppositifolia.
307. Prunella vulgaris.
324. Anisomeles ovata.
410. Elsholtzia rugulosa.
430. Plectranthus sculponiatus.
452. Colquhounia elegans.
497. Ajuga genevensis.

Harland.

468. Dysophylla auricularia.
541, 675. Mesona chinensis.

Henry.

31. Lamium chinense.
38. Salvia japonica.
61. Mosla lanceolata.
66. Mentha arvensis.
72. M. arvensis.
135. Elsholtzia cristata.
159. E. cristata.
198. Prunella vulgaris.
252. Calamintha gracilis.
273. Scutellaria rivularis.
340. Salvia japonica.
345. S. plebeia.
382. S. japonica.
417. Plectranthus excisus.
424. Lophanthus rugosus.
459. Perilla nankinensis.
480. Scutellaria rivularis.
488. Salvia miltiorrhiza.
515. Teucrium japonicum.
556. Salvia japonica.
559. S. plebeia.
560. Stachys oblongifolia.
623. Origanum vulgare.
629. Leonurus sibiricus.
672. Salvia Maximowicziana.
692. Perilla nankinensis.
720. Phlomis albiflora.
756. Salvia plebeia.
757. Calamintha Clinopodium.
770. Ajuga decumbens.

Henry—*continued.*

813. Salvia japonica.
814. Ajuga decumbens.
853. Origanum vulgare.
865. Mosla dianthera.
875. Phlomis umbrosa.
886. Scutellaria rivularis.
941. Teucrium japonicum.
943. Calamintha Clinopodium.
955. Elsholtzia cristata.
974. Plectranthus rubescens.
992. P. nervosus.
1013. Calamintha Clinopodium.
1050. Perilla nankinensis.
1055. Plectranthus nervosus.
1182. Lamium chinense.
1183. Salvia japonica.
1189. Scutellaria indica.
1198. Calamintha gracilis.
1203. Salvia japonica.
1213. Ajuga decumbens.
1233. Marrubium incisum.
1333. Calamintha Clinopodium.
1345. Scutellaria indica.
1347. Salvia miltiorrhiza.
1387. Scutellaria rivularis.
1408. Dracocephalum urticifolium.
1517. Leonurus sibiricus.
1575. Phlomis albiflora.
1779. Prunella vulgaris.
1830A. Calamintha Clinopodium.
1872. Phlomis umbrosa.
1910. P. albiflora.
1923. Prunella vulgaris.
1951. Salvia plebeia.
1957. Calamintha gracilis.
1974. Scutellaria indica.
1997. Salvia miltiorrhiza.
2003. Stachys oblongifolia.
2089. Phlomis gracilis.
2140. Origanum vulgare.
2240. Mosla chinensis.
2274. M. dianthera.
2258A. Perilla nankinensis.
2319. Mosla lanceolata.
2349. Leucas mollissima.
2414. Origanum vulgare.
2442. Phlomis umbrosa.
2459. Stachys adulterina.
2463. Plectranthus excisus.
2489. Mosla dianthera.
2536. Microtoena urticifolia.
2560. Mosla lanceolata.
2599. Leucas mollissima.
2607. Perilla nankinensis.
2609. Mosla lanceolata.
2637. Mentha arvensis.
2674. Elsholtzia cristata.
2725. Plectranthus nervosus.
2727. P. Henryi.
2735. Mentha arvensis.
2742. Mosla dianthera.
2763. Plectranthus Henryi.
2778. Calamintha Clinopodium.
2790. Mosla lanceolata.
2889. Elsholtzia communis.
2889, A. E. communis.
2919. Teucrium Pernyi.
2926. Plectranthus striatus.
2983. P. coetsa.
3023. Perilla nankinensis.
3086. Plectranthus Henryi.
3094. P. Henryi.
3119. Teucrium bidentatum.
3272. Elsholtzia communis.
3334, A. Colquhounia elegans.
3359, A. Scutellaris Franchetiana.
3364. Ajuga genevensis.
3514. Stachys oblongifolia.
3576. Phlomis albiflora.
3661. Calamintha Clinopodium.
3772. Salvia japonica.
3837. Ajuga decumbens.
3840. Nepeta Glechoma.
4089. Colquhounia elegans.
4111. Phlomis gracilis.
4150. Teucrium bidentatum.
4208. Scutellaria obtusifolia.
4257. Teucrium Pernyi.
4325. Mosla chinensis.
4356. Perilla nankinensis.
4442. Anisomeles ovata.
4455. Perilla ocymoides.
4488. Amethystea coerulea.
4597. Lycopus lucidus.
4600. Teucrium Pernyi.
4615. Stachys kouyangensis.
4676. S. adulterina.
4700. Dracocephalum urticifolium.
4812. Mosla lanceolata.
4841. Calamintha Clinopodium.
4855. Plectranthus excisus.
4895–7. Mosla lanceolata.
4916. Calamintha Clinopodium.
4971. Perilla ocymoides.
5017. Mosla lanceolata.
5104. Salvia japonica.
5105. Plectranthus nervosus.
5141. Teucrium ornatum.
5191. T. japonicum.
5197. Lycopus lucidus.
5220. Lamium chinense.
5330. Dracocephalum urticifolium.
5415, A, B. Salvia japonica.
5770 & A. Orthosiphon debilis.
5798. Dracocephalum urticifolium.
5883. Scutellaria indica.
5913. Stachys kouyangensis.
5943. S. oblongifolia.
5974. Scutellaria indica.
6029. Phlomis umbrosa.

✓ = Represented in Mo. Bot. Gard. Herb.

Henry—*continued.*

6038 & A. Ajuga ciliata.
6050. Orthosiphon debilis.
6087. Scutellaris Franchetiana.
6109 & A. Dracocephalum urticifolium.
6179. Phlomis umbrosa.
6192. Stachys adulterina.
6285. Ajuga ciliata.
6322. Dracocephalum urticifolium.
6406. Teucrium japonicum.
6432. Phlomis umbrosa.
6437. Teucrium ornatum.
6471. T. ornatum.
6482. Loxocalyx urticifolius.
6482A. Microtoena robusta.
6621. Salvia japonica.
6672. Teucrium japonicum.
6700. T. ornatum.
6755. Elsholtzia polystachya.
6795. Loxocalyx urticifolius.
6822. Salvia Maximowicziana.
6844. Teucrium palmatum.
6864. Salvia Maximowicziana.
6996. Elsholtzia polystachya.
7037. Hancea nudipes.
7041. Dracocephalum urticifolium.
7049. Plectranthus excisus.
7088. Dracocephalum urticifolium.
7210. Mentha arvenis.
7227. Teucrium Pernyi.
7233. Plectranthus excisus.
7266. Loxocalyx urticifolius.
7316. Stachys kouyangensis.
7325. Chelonopsis deflexa.
7328. Teucrium japonicum.
7339. Microtaena urticifolia.
7360. Phlomis umbrosa.
7376. Mosla lanceolata.
7422. Teucrium quadrifarium.
7631. Microtaena robusta.
7689. Plectranthus striatus.
7765. Leucosceptrum sinense.
7938. Teucrium quadrifarium.
8114. Leucas mollissima.
8168. Dysophylla auricularia.
8181. Moschosma polystachyum.
8509. Leucas zeylanica.
8533. Orthosiphon stamineus.
8709. Ocimum sanctum.
8735. Teucrium japonicum.
8736. Hyptis suaveolens.
9020A. Plectranthus ternifolius.
9042. P. striatus.
9043. P. striatus.
9073. P. striatus.
9082. Pogostemon nigrescens.
9131A. Calamintha Clinopodium.
9136. Elsholtzia flava.
9162. Craniotome versicolor.
9196. Hancea sinensis.
9222 & A. Coleus Esquirolii.
9231 & A. Calamintha Clinopodium.
9233. Elsholtzia pilosa.
9235. Plectranthus sculponiatus.
9250. Elsholtzia blanda.
9250A. E. blanda.
9368, A & B. Elsholtzia Bodinieri.
9397 & A. Leucosceptrum canum.
9639. Scutellaria indica.
9711. Elsholtzia pilosa.
9726. E. communis.
9766. Calamintha Clinopodium.
9794. Scutellaria indica.
9796–7. Plectranthus striatus.
9800. Orthosiphon rubicundus.
9804. Prunella vulgaris.
9811. Plectranthus eriocalyx.
9840. P. striatus.
9845. Teucrium quadrifarium.
9849. Salvia japonica.
9850. Microtaena insuavis.
9892. Elsholtzia communis.
9912. E. rugulosa.
9950A. E. heterophylla.
10,029 & A. Leucas mollissima.
10,053. Salvia yunnanensis.
10,067 & A. Plectranthus adenanthus.
10,068. Teucrium simplex.
10,069 & A. Plectranthus angustifolius.
10,070. Elsholtzia blanda.
10,071–2. Plectranthus striatus.
10,073 & A. P. Coetsa.
10,074, A & B. Stachys kouyangensis.
10,075. Plectranthus Coetsa.
10,076 & A. Phlomis rugosa.
10,149 & A. Anisomeles ovata.
10,214 & A. Melissa parviflora.
10,216 & A. Phlomis bracteosa.
10,237. Loxocalyx urticifolius.
10,238. Plectranthus Coetsa.
10,239. Elsholtzia flava.
10,292 & A. Leucas ciliata.
10,305. Elsholtzia heterophylla.
10,364. Ajuga macrosperma.
10,382. Leonurus sibiricus.
10,418. Pogostemon glaber.
10428, A & B. Mentha arvensis.
10,458. Scutellaria discolor.
10,560. S. amoena.
10,581. Ajuga genevensis.
10,585. Lamium amplexicaule.
10,636. Paralamium gracile.
10,637. Salvia plebeia.
10,657. Scutellaria discolor.
10,861. Ajuga remota.
10,900. A. macrosperma.
10,921. Colebrookia oppositifolia.
10,986. Teucrium Pernyi.

Henry—*continued.*

Bs —

11,007. Scutellaria indica.
11,046. Gomphostemma lucidum.
11,047. Teucrium quadrifarium.
11,137. Origanum vulgare.
11,166. Plectranthus striatus.
11,174. Pogostemon nigrescens.
11,215. Lophanthus rugosus.
11,251. Craniotome vesicolor.
11,266. Plectranthus striatus.
11,279. P. Coetsa.
11,286. P. striatus.
11,305. Elsholtzia polystachya.
11,375. Ocimum basilicum.
11,445. Phlomis rugosa.
11,487. Pogostemon glaber.
11,576. Plectranthus striatus.
11,582. Colquhounia elegans.
11,583. Microtoena insuavis.
11,824. Calamintha Clinopodium.
11,593, A & B. Colebrookia oppositifolia.
11,684, A, B, & C. Ajuga macrosperma.
11,699. Pogostemon fraternus.
11,919 & A. Scutellaria rivularis.
12,011 & A. Gomphostemma lucidum.
12,226 & A. Dysophylla linearis.
12,253. Gomphostemma parviflorum.
12,307. G. lucidum.
12,311. Dysophylla auriculata.
12,314. Gomphostemma lucidum.
12,339. Plectranthus calcaratus.
12,368. Scutellaria discolor.
12,368 & A. S. discolor.
12,475. Plectranthus striatus.
12,479. Dysophylla linearis.
12,501. Gomphostemma microdon.
12,518 & A. G. pedunculatum.
12,537. Coleus bracteatus.
12,563. Pogostemon nigrescens.
12,581. Plectranthus striatus.
12,588. Microtaena insuavis.
12,599. Phlomis rugosa.
12,607, A & B. Colquhounia elegans.
12,609. Gomphostemma lucidum.
12,610. Acrocephalus capitatus.
12,618. Lycopus lucidus.
12,628. Dysophylla linearis.
12,670. Elsholtzia kachinensis.
12,675. Anisochilus pallidus.
12,698. Plectranthus Coetsa.
12,721. P. Stracheyi.
12,740. Colebrookia oppositifolia.
12,832. Pogostemon glaber.
12,913. Eurysolen gracilis.
13,393. Geniosporum strobiliferum.
13,492. Plectranthus sculponiatus.
13,498. Coleus bracteatus.
13,594. Gomphostemma pedunculatum.
13,695. Dracocephalum urticifolium.
13,771. Scutellaria laxa.
13,772. S. macrantha.
13,774. Plectranthus Coetsa.
13,792. P. adenanthus.

Hongkong Herbarium.

63. Teucrium Pernyi.
66, 67. T. japonicum.
70. Salvia plebeia.
73. Chelonopsis moschata.
333. Plectranthus amethystoides.
335. Teucrium japonicum.
336. T. Pernyi.
605. Leucas lavandulaefolia.
1333. Mosla chinensis.
3415. Scutellaria Franchetiana.
3427. Lamium foliatum.

Howell.

77. Elsholtzia polystachya.
126. Plectranthus macranthus.
136. Microtaena Delavayi.

Lamont.

570. Dysophylla auricularia.

Maingay.

22. Leonurus macranthus.
45. Calamintha Clinopodium.
46. Thymus Serpyllum.
112. Scutellaria macrantha.
343. Stachys palustris.
534. Mosla dianthera.
536–7. Perilla nankinensis.
539. Mentha arvensis.
541. Prunella vulgaris.
542. Stachys palustris.
544. Salvia plebeia
703. Leonurus sibiricus.
736. Salvia plebeia.

Maire.

24. Ocimum basilicum.
25. Perilla avium.
86. Scutellaria macrantha.
88. Stachys leptodon.
127. Elsholtzia polystachya.
181. Lamium amplexicaule.
182. Stachys leptodon.
207. Salvia plebeia.
209. Ajuga genevensis.
213. Scutellaria amoena.
215. Salvia plebeia.
217. S. yunnanensis.
219. Orthosiphon rubicundus.
313. Plectranthus striatus.
314. Origanum vulgare.
425. Plectranthus striatus.
632. Elsholtzia communis.
633. E. rugulosa.
634. E. polystachya.
636. Lamium amplexicaule.
637. Nepeta Glechoma.
647. Plectranthus striatus.
657. Lycopus lucidus.
663. Salvia plebeia.
734. Perilla avium.
774. Prunella vulgaris.
775. P. vulgaris.
776. P. vulgaris.
777. Calamintha Clinopodium.
778. C. Clinopodium.
780. Melissa parviflora.
781. Stachys kouyangensis.
782. Salvia japonica.
783. Ajuga remota.
923. Mentha arvensis.
1169. Craniotome versicolor.
1189. Ajuga genevensis.
1202. Elsholtzia communis.
1203. E. heterophylla.
1204. E. pilosa.
1205. E. cristata.
1206. E. communis.
1220. Lycopus lucidus.
1221. Colquhounia elegans.
1235. Elsholtzia polystachya.
1292. Lamium amplexicaule.
1293. Plectranthus striatus.
1294. Salvia yunnanensis.
1299. Calamintha Clinopodium.
1300. Elsholtzia polystachya.
1389. Plectranthus eriocalyx.
1394. Elsholtzia rugulosa.
1467. Scutellaria amoena.
1470. Prunella vulgaris.
1471. Calamintha Clinopodium.
1472. Ajuga genevensis.
1473. Marrubium incisum.
1542. Elsholtzia Bodinieri.
1543. E. heterophylla.
1580. Leucas ciliata.
1581. Craniotome versicolor.
1582. Plectranthus striatus.
1583. P. eriocalyx.
1584. Leonurus sibiricus.
1590. Origanum vulgare.
1591. Stachys leptodon.
1599. Plectranthus eriocalyx.
1605. Leucas ciliata.
1614. Stachys kouyangensis.
1615. Plectranthus nervosus.
1623. Elsholtzia communis.
1624. E. kachinensis.
1625. Marrubium incisum.
1628. Elsholtzia rugulosa.
1630. Scutellaria Tayloriana.
1637. Elsholtzia polystachya.
1640. E. cristata.
1758. Orthosiphon rubicundus.
1759. Calamintha Clinopodium.
1760. Leonurus sibiricus.
1762. Elsholtzia cristata.
1778. E. flava.
1794. Scutellaria amoena.
1843. Micromeria biflora.
1877. Lycopus lucidus.
1879. Prunella vulgaris.
1993. Leonurus sibiricus.
2004. Orthosiphon rubicundus.
2022. Stachys leptodon.
2024. Plectranthus eriocalyx.
2030. P. striatus.
2035. Elsholtzia pilosa.
2036. E. flava.
2037. E. heterophylla.
2040. Plectranthus eriocalyx.
2042. Calamintha Clinopodium.
2043. Lamium amplexicaule.
2158. Melissa parviflora.
2161. Marrubium incisum.
2171. Elsholtzia flava.
2173. E. polystachya.
2174. E. flava.
2178. Scutellaria Tayloriana.
2181. Orthosiphon rubicundus.
2183. Scutellaria macrantha.
2185. Prunella vulgaris.
2187. Calamintha Clinopodium.
2220. Salvia yunnanensis.
2265. Scutellaria Tayloriana.
2266. Salvia yunnanensis.
2294. Scutellaria Tayloriana.
2301. S. amoena.
2303. Calamintha Clinopodium.
2309. Elsholtzia rugulosa.
2310. E. polystachya.
2317. Elsholtzia cristata.
2344. Plectranthus striatus.
2396. Elsholtzia Bodinieri.
2399. E. rugulosa.
2422. Ajuga remota.

Maire—*continued.*

2483. Plectranthus nervosus.
2485. Stachys kouyangensis.
2494. Elsholtzia cristata.
2497. Plectranthus angustifolius.
2527. Lycopus lucidus.
2531. Scutellaria Tayloriana.
2600. Plectranthus angustifolius.
2602. Elsholtzia polystachya.
2604. Elsholtzia polystachya.
2614. Perilla avium.
2644. Salvia yunnanensis.
2651. Melissa parviflora.
2661. Salvia yunnanensis.
2692. Origanum vulgare.
2693. Orthosiphon rubicundus.
2694. Calamintha Clinopodium.

Moellendorf.

92. Ajuga lupulina.

Monbeig.

212. Nepeta Glechoma.
213. N. Cataria.
214. Calamintha Clinopodium.
215. Lamium amplexicaule.
216. Scutellaria amoena.
217. Ajuga Forrestii.

Morse.

134. Plectranthus ternifolius.
229. Leucas mollissima.
257. Gomphostemma leptodon.
308. Scutellaria indica.
385. Leonurus sibiricus.
478. Scutellaria indica.
479. Ajuga genevensis.
520. Perilla nankinensis.
531. Orthosiphon marmoritis.

Playfair.

97. Anisomeles ovata.

Pratt.

71. Salvia cynica.
113. Galeopsis Tetrahit.
152. Hancea sinensis.
173. Phlomis umbrosa.
249. Ajuga ovalifolia.
350. Dracocephalum urticifolium.
472. Nepeta lamiopsis.
473. Phlomis umbrosa.
479. Ajuga ovalifolia.
491. Salvia hians.
500. Stachys kouyangensis.
501. Dracocephalum sibiricum.
505. Phlomis megalantha.
506. Ajuga Forrestii.
529. Plectranthus rugosus.
546. Salvia hians.
565. Ajuga lupulina.
579. Dracocephalum tanguticum.
580. Scutellaria amoena.
582. Dracocephalum Wilsoni.
604. Origanum vulgare.
614. Salvia brevilabra.
884. Elsholtzia eriostachya.

Przewalski.

96, 387. Elsholtzia ianthina.

Reid.

8. Scutellaria rivularis.

Rosthorn.

1122. Plectranthus Rosthornii.
2188. Teucrium ornatum.
2530. Phlomis medicinalis.
2543. Elsholtzia calycocarpa.

Sampson.

390. Ajuga genevensis.

Schindler.

167. Leonurus sibiricus.

Seeman.

2439. Anisomeles ovata.

Silvestri.

2000. Prunella vulgaris.
2036. Leonurus sibiricus.
2060. Origanum vulgare.
2069, 2072. Phlomis umbrosa.
2079. Plectranthus Coetsa.
2080. Plectranthus excisus.
2082, 2082A, 2083, 2083B. P. ricinispermus.
2085–8A. Elsholtzia communis.

Soulié.

93. Elsholtzia eriostachya.
97. Salvia brevilabra.
188. Phlomis tatsiensis.
203. Salvia Przewalskii.
218. Galeopsis Tetrahit.
226–7. Elsholtzia cristata.
237. Galeopsis Tetrahit.
238. Salvia tricuspis.
243. Dracocephalum tanguticum.
300. Salvia hians.
313. S. Przewalskii.
375. Elsholtzia eriostachya.
448. Stachys kouyangensis.
484. Dracocephalum sibiricum.
522. Ajuga genevensis.
526. Scutellaria amoena.
600. Salvia hians.
627. S. tricuspis.
727. Stachys kouyangensis.
786. Dracocephalum Wilsoni.
816. D. sibiricum.
819. Ajuga ovalifolia.
867. Phlomis tatsiensis.
944. Ajuga lupulina.
948. Dracocephalum Wilsoni.

Wilford.

214. Anisomeles ovata.
215. Teucrium quadrifarium.
216. Mesona chinensis.
347. Scutellaria indica.

Williamson.

69. Leonurus sibiricus.

Wilson.

83. Phlomis albiflora.
120. Lamium amplexicaule.
201. L. chinense.
203A. Salvia japonica.
209. Scutellaria yunnanensis.
211. Lamium chinense.
225A. Ajuga genevensis.
229. Salvia japonica.
323. Dracocephalum urticifolium.
379. Leucas mollissima.
390. Scutellaria rivularis.
402. Salvia miltiorrhiza.
423A. Teucrium ornatum.
442. Ajuga genevensis.
443. A. genevensis.
458. Stachys oblongifolia.
483A. Plectranthus nervosus.
588. Lamium album.
595. Dracocephalum urticifolium.
744. D. urticifolium.
755. D. urticifolium.
796. Stachys palustris.
810. Calamintha Clinopodium.
862. Leonurus sibiricus.
911. Calamintha gracilis.
929. Prunella vulgaris.
962. Dracocephalum urticifolium.
969. Dracocephalum urticifolium.
1051. D. urticifolium.
1054. Phlomis umbrosa.
1129. Dracocephalum urticifolium.
1211. Scutellaria Franchetiana.
1299 & A. Elsholtzia polystachya.
1335. Salvia japonica.
1380. Stachys adulterina.
1405. Dracocephalum urticifolium.
1412. Teucrium quadrifarium.
1429. Plectranthus grosseserratus.
1451. Teucrium ornatum.
1452. Phlomis umbrosa.
1529. Origanum vulgare.
1537. Lycopus lucidus.
1541. Stachys adulterina.
1682. Plectranthus ricinispermus.
1682A. P. excisus.
1688. Salvia Maximowicziana.
1745. Elsholtzia cristata.
1756. Marrubium incisum.
1852. Dracocephalum urticifolium.
1881. Ajuga genevensis.
1970. Dracocephalum urticifolium.
2121. D. urticifolium.
2227. Scutellaria angulosa.
2280. Dracocephalum urticifolium.

Wilson—*continued.*

2338. Ajuga ciliata.
2349. Salvia Maximowicziana.
2367. Stachys palustris.
2382. Plectranthus excisus.
2389. Scutellaria angulosa.
2399. Salvia Maximowicziana.
2406. Phlomis megalantha.
2499. Microtoena urticifolia.
2502. M. Delavayi.
2508. Lophanthus rugosus.
2512. Calamintha Clinopodium.
2513. Plectranthus excisus.
2565 & A. Dracocephalum urticifolium.
2577. Plectranthus nervosus.
2582. P. excisus.
2612. Leonurus macranthus.
2651. Plectranthus striatus.
2652. P. ricinispermus.
2659. Perilla nankinensis.
2774 & A. Dracocephalum urticifolium.
2819. Plectranthus ricinispermus.
2828. Mentha arvensis.
4319. Plectranthus leucophyllus.
4321. P. discolor.
4322. P. discolor.
4325. Ajuga ciliata.
4327. Galeopsis Tetrahit.
4331 & A. Ajuga ovalifolia.
4332. A. lupulina.
4333. A. Forrestii.
4335 & A. Phlomis umbrosa.
4337. P. umbrosa.
4338. P. umbrosa.
4339. Elsholtzia flava.
4341A. Salvia japonica.
4342. S. cynica.
4343. S. Maximowicziana.
4344. S. glutinosa.
4345. S. brevilabra.
4346. S. tricuspis.
4347. S. tricuspis.
4348 & A. Orthosiphon debilis.
4349. O. rubicundus.
4350. Lamium chinense.
4353. Teucrium japonicum.
4354. T. ornatum.
4355. Scutellaria yunnanensis.
4356. S. obtusifolia.
4358. S. amoena.
4359. S. amoena.
4360. S. yunnanensis.
4361. S. yunnanensis.
4364. Elsholtzia cristata.
4368. Dracocephalum urticifolium.
4370 & A. D. urticifolium.
4371. D. urticifolium.
4372. Microtoena urticifolia.
4373. Hancea sinensis.
4376. Plectranthus striatus.
4377. P. striatus.
4378. Mosla dianthera.
4379. Plectranthus striatus.
4380. P. Coetsa.
4382. P. adenanthus.
4384. P. Coetsa.
4385. P. excisus.
4387. P. sculponiatus.
4388. P. sculponiatus.
4574. P. adenanthus.
5112. Phlomis umbrosa.
5113. Prunella vulgaris.
5115. Salvia japonica.
5118A & B. Plectranthus macranthus.
5119. Phlomis rugosa.
5120. Plectranthus striatus.
5122. Scutellaria Franchetiana.
5124. Hancea sinensis.
5125. Plectranthus eriocalyx.
5126. Salvia Maximowicziana.
5128. Teucrium bidentatum.
5129. Scutellaria sessilifolia.
5130. Melissa parviflora.
5131. Scutellaria obtusifolia.
5132. Hancea sinensis.
5133. Calamintha Clinopodium.
5714. Scutellaria yunnanensis.
5717. Elsholtzia cristata.

Wright.

384. Salvia plebeia.
388. Scutellaria indica.
389. Anisomeles ovata.
390. Leonurus sibiricus.
391. Leucas mollissima.
392. Teucrium quadrifarium.
492. Mosla lanceolata.

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Contributions to the Knowledge of the Old World Species of the Genus Mahonia.

BY

H. TAKEDA, D.I.C.

With Plates I—XXXVII.

THE genus *Mahonia* comprises numerous species which are distributed mainly over Asia and America. The genus was thoroughly examined by Fedde from systematic, anatomical, and morphological points of view.* This author maintains the opinion that the genus *Mahonia* should be treated as quite distinct from *Berberis*.† Recently Rehder has put back a few species to *Berberis*, but without giving any reasons.‡

Since the publication of Fedde's monograph several new species have been described, chiefly from China. In Fedde's work there are mentioned some seven species occurring in China. This number was increased by Hemsley and Wilson in describing a new species in 1906,§ and soon afterwards by Gagnepain with three new species in 1908.|| Meanwhile Léveillé added another species *M. ganpiensis*, which is however of a doubtful nature.¶ Quite recently, in 1913, C. K. Schneider, who worked out Wilson's Chinese *Berberideae*, has added seven new species.** He also gives in the same publication an enumeration of all the known Asiatic species, accompanied by an analytical key. According to this author, there are eighteen species known to occur in Asia, and all except two species are natives of China. Sprague has lately pointed out that *M. confusa*, Sprague, which was published in 1912, is not included in this enumeration, and that at least some of the specimens referred by Schneider to *M. Fortunei* represent the co-type specimens of

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* Fedde, Versuch einer Monographie der Gattung Mahonia, in Engl. Bot. Jahrb. xxxi, 1901.

† Fedde, l.c. p. 66 et seq.

‡ Rehder in Mitteilung. d. Deutsch. Dendrol. Gesellsch., 1912, p. 184.

§ Hemsley and Wilson, in Kew Bull., 1906, p. 152.

|| Gagnepain in Bull. Soc. Bot. Fr. lv, 1908.

¶ Léveillé, Florilegium Chinense xciv, in Fedde, Repert. vi, 1909, p. 372.

** C. K. Schneider, in Sargent, Pl. Wilsonianae, i, pt. 3, 1913.

*M. confusa.** This species—*M. confusa*—is moreover described by Schneider in his work as *M. Zemanii*, as the present writer has pointed out.† As a matter of fact, there are a few others to which no references at all are made in Schneider's enumeration, some long known from India, and some from China.‡

Before we enter into the systematic account of the genus some remarks may perhaps be made upon morphological features.§

The leaf of *Mahonia* is always imparipinnate and is furnished with a pair of stipules at the base. The stipules are adnate to the petiole and only their upper free portions are noticeable. For the sake of simplicity, these free portions alone are taken into account in the descriptions given in the following pages. They may be long, short, deflexed, curved, straight, and so forth. When the stipules are completely united with the petiole, they are conveniently described as being "absent."

The rhachis of the leaf extends, as a rule, beyond the uppermost pair of leaflets, so that the terminal leaflet appears as if "petiolulate." The length of this terminal extension of rhachis varies to some extent, even within one species. In certain species the terminal extension is usually reduced to a minimum in length, resulting in the terminal leaflet becoming apparently "sessile," e.g. in *M. Fortunei*. Sometimes a terminal leaflet is united at the base with one of the leaflets of the uppermost pair which often appears to consist of a single leaflet. In this case the terminal leaflet is broader than usual and is more or less deeply cleft on one side. In rarer instances such conspicuous lateral incisions, which indicate fusion of two or more organs, cannot be detected in the terminal leaflet, consequently the leaflet is only abnormally broader and apparently more lengthily "petiolulate" than usual. The presence or absence of the terminal extension of rhachis cannot therefore be regarded as a good distinguishing character of species in this genus. In the following descriptions no mention is made of the presence of this extension of rhachis unless it happens to be of diagnostic value. In this connexion it may perhaps be pointed out that the length of petiole, namely, the distance between the base of the petiole and the lowermost pair of leaflets, is an important diagnostic feature not to be overlooked.‖ In many species the petiole is very short, measuring only a few centimeters, whilst in some it is comparatively long. While the presence or absence of the terminal extension of rhachis cannot be taken as a criterion for distinguishing *M. Fortunei* and *M. confusa*, the above-mentioned character is always decisive.*

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* Sprague, in Kew Bull., 1914, p. 232.

† Takeda, ibid., 1915, p. 128.

‡ For example, *M. acanthifolia*, *M. Leschenaultii*, *M. trifurca*, *M. ganpiensis*, etc.

§ In reference especially to the group "Longibracteatae," for which see Fedde, l.c. p. 73, etc.

‖ Cf. Fedde, l.c. p. 36.

It hardly needs mentioning that the leaflets are sessile among the species belonging to the " Longibracteatae."†

The inflorescence is a raceme, usually simple, but occasionally branched near the base, thereby more or less assuming the nature of a panicle. The flowers are invariably stalked and are disposed on the rhachis either rather loosely or densely, according to the species. They are arranged in a spiral, or in some cases even in a subwhorl.‡

The bracts subtending each flower afford a good distinguishing character of species. They may be small, scaly, pointed or blunt, narrow or broad, and so forth. They are persistent, and increase in size at the time of fruit, but as a rule only very slightly.

The pedicels may be longer or shorter than the bracts which subtend them. They may in the fruit-bearing stage become thickened, recurved, spreading, or nodding only at the apex.

The prophylls are as a rule entirely suppressed in the group *Longibracteatae.*§ It is however of much interest to record here that conspicuous prophylls, similar to, or sometimes smaller and narrower than, the bracts are seen in our new species, *M. bracteolata* and *M. Mairei*. They are present in most of the flowers of these species situated below the middle of the inflorescence, occurring one or two on each pedicel.

The flowers are yellow in colour, and are, in some species, fragrant. Three whorls of sepals are invariably present, two whorls of petals, two whorls of stamens with three members in each, and a pistil in the centre.|| A few species have however been described as having only six sepals. Examination of specimens has convinced the present writer that those statements are erroneous. In most cases the sepals of the outermost whorl are minute and much smaller than the others. In some cases however they are almost or quite as large as those of the middle whorl or even of the innermost whorl. To regard the outermost sepals as bracts is absurd.¶

Shape, size, and nervation of sepals and of petals are liable to variation to a certain extent, yet they exhibit very distinctive

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* Cf. Fedde, l.c. p. 36; also Schneider, l.c. p. 379, under the remarks on *M. Zemanii*.

† Cf. Fedde, l.c. p. 37.

‡ Fedde, l.c. p. 41, states this phenomenon is brought about by the unequal growth of the rhachis.

§ Cf. Fedde, l.c. p. 42.

|| Cf. Fedde, l.c. p. 42.

¶ Cf. Fedde, l.c. pp. 42, 43.

features in each species. In the accompanying plates the writer has endeavoured to show, for a few species, dissected floral organs from more than one specimen. It will be seen from those figures that the variation is only slight, and not so great as is often supposed. In the following descriptions, therefore, measurements of these organs are given as far as possible. It must be borne in mind that when dissecting for this purpose, a fully developed flower has to be chosen. Figs. 141–157 have been taken from three specimens of the same species in different stages of development.

The stamens are very characteristic in each species. The filament generally exceeds the anther or in certain species is nearly equal in length. It is generally more or less thickened just below the anther, and in some cases it is furnished with a tooth-like projection on each side. This feature is very stable throughout the genus. Only in one case has the writer come across a specimen of a usually edentate species possessing more or less rudimentary teeth (fig. 42). Whether this specimen ought to be regarded as a dentate variety has not been decided from lack of sufficient material. The connective is an extension of the filament. As has been pointed out by Gagnepain, this organ affords a good diagnostic character.* In the majority of species it is as broad as or slightly broader than the filament, but in a few cases it is much narrower. In many species it is more or less triangular and often apiculate, in others almost truncate. It should always be remembered that a mature stamen has to be examined. An undeveloped stamen possesses generally an almost truncate connective which may later become decidedly triangular. The figures above referred to clearly illustrate this fact. A herbarium specimen shows only a certain stage in the life-cycle of a plant, and no more. Herbarium botanists have to bear carefully this fact in mind. It has not seldom happened that different stages of one and the same species have been described as distinct species.

The ovaries are either furnished with or are almost devoid of a distinct style. Sometimes it is not at all easy to decide whether a very short style is present or whether the style is totally absent. The number of ovules contained in the ovary is not very constant. This character is not of much use in distinguishing closely allied species.

The fruit is a berry, generally bluish-black in colour and more or less covered with waxy powder. The berries are ovoid in the majority of species, but in some cases they are globose.

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* Gagnepain, Les Mahonia asiatiques de l'herbier du Muséum, in Bull. du Mus. Nation. d'Hist. Nat. Paris, xiv, 1908.

As regards the classification of the genus mention must first be made of the subdivisions proposed by Fedde. He divided the genus *Mahonia* into four groups, three of which occur in America, while the fourth, *Longibracteatae*, is represented mainly in the Old World, and with it only are we concerned at present. Fedde distinguishes the Asiatic species in the first place by the nature of the leaflets and particularly by the teeth—whether these occur along the whole length of the margin or are confined to the upper region of the leaflet.*

Gagnepain, who paid special attention to the Asiatic species, points out that the size, length, consistency, teeth, etc., of a leaflet are subject to variation and are not definite, so that these characters cannot be made use of in an analytical key of the species.† He further mentions the important features exhibited by the sepals, petals, stamens, and ovary. The same author gives a key to the Asiatic species based upon these characters combined with certain others. In the first place he distinguishes two subdivisions by means of the stamens.‡

Schneider, on the other hand, distinguishes two primary groups by the ovary—whether the ovary is provided with a distinct style or not.§ Other organs made use of by this botanist are the leaves, pedicels, bracts, and occasionally the number of ovules contained in the ovary.

The writer is of opinion that most of the characters above mentioned, except perhaps the consistency of the leaflet and the number of ovules, are relatively reliable, and may be regarded as good diagnostic characters. It is however difficult to decide which of these organs should be reckoned of primary importance as showing actual relationship between each species. It appears that Schneider's arrangement based on the presence or absence of style is more natural than Gagnepain's system. It is, as is pointed out above, not always easy to make out whether a stigma is actually sessile or shortly stalked. For instance, Schneider himself places his *M. Zemanii* (=*M. confusa*, Sprague), which possesses a practically sessile stigma, in his first division, the members of which are characterised by having a distinct style. This method is therefore not very easy in practice especially when fruit is lacking. It must however be admittted that according to this classification closely related species, such as *M. Fortunei* and *M. confusa*, would fall into the same group, whereas they would be distantly separated if the stamens were made the primary principle for subdivision.

The writer regrets not being in a position to express more fully his opinion of the existing classifications or to put forward a new one, since his observations have been made only on a limited number of species most of which are represented by specimens of flower or of fruit alone. Certain species, the type specimens of which exist only in some continental herbaria, are known to the writer only from descriptions. In such cases it is not always possible to form an adequate idea of those species and to find out their exact relationship to other species. Under such circumstances no definite view as to the affinity is expressed in the following pages. The writer may however call attention to the fact that the relative length of sepals—whether the outermost ones are markedly shorter than, or nearly equal in length to, those of the other whorls—may possibly show natural relationship. Unfortunately the writer has been unable to examine this point in all the species, and must leave it undecided.

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* Fedde, l.c. pp. 78, 79.

† Gagnepain, l.c. p. 133.

‡ Gagnepain, l.c. p. 134.

§ Schneider, in Sargent, Pl. Wilsonianae, i, p. 380, 1913.

As a result of the present investigation, there are ten or possibly eleven species occurring in India, twenty-four or twenty-five species in China, three or possibly more species in Formosa, and one species in each of the following regions—Malacca, Annam, Siam, Java, Burma, and the Philippine Islands. In Japan we have *M. japonica*, DC. which is frequently cultivated in gardens. Strangely enough its native country is up to the present unknown. According to Chikinshô, a Japanese gardening manual, a *Mahonia* was imported into Japan in 1684. It is however not certain whether this was *M. japonica* or *M. Fortunei*,* nor in what country it originated.

The present study was commenced in 1912 and, though very much interrupted, has been carried out in the Kew Herbarium. During that time the writer had the privilege of examining all the specimens preserved in the Herbarium, Royal Botanic Garden, Edinburgh, and also the Indian specimens in the Herbarium, Royal Botanic Garden, Calcutta. In addition to those, most of the specimens kept in the British Museum have also been consulted. The writer expresses his sincere thanks to the authorities of the above-mentioned establishments for their courtesy in allowing him to study the valuable specimens. The writer is indebted to Dr. B. Hayata for giving him an opportunity of examining specimens from the remoter parts of Formosa when he visited Japan in 1913. The writer also takes this opportunity of thanking Mr. J. S. Gamble for the loan of the Indian specimens of his own herbarium.

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* This species is also very frequently cultivated in Japan, having been originally imported from China.

I. THE INDIAN SPECIES.

Since 1855 when Sir J. D. Hooker and Dr. Thomson unhesitatingly united * all the Indian species published up to that date together with *M. japonica* into a single species, *Berberis nepalensis*,† almost all the later workers have indiscriminately followed this opinion, especially with regard to the Indian species. Seventeen years afterwards Hooker and Thomson themselves recognised a variety *Leschenaultii*, which had been described before as a distinct species.‡ This variety was again differentiated from the type by Fedde,§ but has been entirely ignored by all others, including the more recent observers such as Gagnepain ‖ and Schneider.¶ Thus there is only one species known as a native of India, and this species is distributed over the whole of the Himalayas, Nepal and Assam, and if the var. *Leschenaultii* is treated as the same species, it also occurs in the Nilghiri. Moreover, some authors have recorded its occurrence even outside India, namely, Malacca, Burma,** Java,†† China,‡‡ Formosa,§§ Philippine Islands,‖‖ etc. It is also often stated in literature that certain other species are related to or are comparable with *M. napaulensis*. It is therefore necessary to ascertain the real *M. napaulensis*, DC. and this has been one of the writer's chief objects in this paper.

It has been found that the statements above referred to are erroneous and that the true *M. napaulensis* has never been found outside Nepal. It may also be noted here that the only specimens of this species existing in herbaria are those collected by Buchanan in 1802 and by Wallich in 1821; it has never been gathered since except the fragments of a leaf which are reproduced in our plate.

De Candolle distinguishes a var. *Roxburghii* ¶¶ which, as a result of a careful examination of the co-type specimens, has been found to be quite a distinct species and has consequently been raised to that rank.

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* Hook. et Thoms. Fl. Indica, i, p. 219.

† The oldest specific name given by De Candolle in 1821 is "*napaulensis*." Later it is often spelled "*nepalensis*."

‡ Hooker, Fl. Brit. Ind. i, p. 109, 1872.

§ Fedde, l.c. p. 123.

‖ Gagnepain, in Bull. du Mus. Nation. d'Hist. Nat. Paris, xiv, 1908.

¶ Schneider, in Sargent, Pl. Wilsonianae, i, 1913.

** Kurz, Forest Fl. of Burma, i, p. 58, 1877; Hemsley, in Journ. Linn. Soc. Bot. xxviii, p. 17, 1890.

†† Miq. Fl. Ind. Bot. i, 2, p. 88, 1859.

‡‡ Hance in Journ. Bot., n.s. xi, p. 2, 1882; Forbes et Hemsl., Ind. Fl. Sin. i, p. 31, 1886; Franch. Pl. Delav. i, p. 35, 1889. See also the introductory remark on the Chinese species, p. 224.

§§ Matsumura in Tôkyô Bot. Mag. xii, p. 54, 1898; Matsum. et Hayata, Enum. Pl. Formos., p. 18, 1906; Hayata, Fl. Mont. Formosae, p. 47, 1908.

‖‖ Merrill in Phil. Journ. Sc. i, suppl., p. 190, 1906.

¶¶ DC. Prodr. i, p. 109, 1824.

Hooker and Thomson's var. *Leschenaultii*,* or *Berberis Leschenaultii*, Wall. is an absolutely different species, and can by no means be confused with or united to *M. napaulensis*, DC.

Fedde has described two new varieties of this species, one of of which, var. *macrophylla*,† is very doubtful, since the original specimen was derived from a plant cultivated in the Botanic Garden in Petrograd which was apparently sterile.

The other var. *pycnophylla*,‡ seems to be closely related to *M. napaulensis*, but is a distinct species, being distinguished above all by the nature of the leaf and of the bracts in the inflorescence. The fruit is unknown in both *M. napaulensis* and in *M. pycnophylla*, so that it is impossible to say whether any further difference is exhibited by the fruit apart from the number of ovules, a character not always very reliable.

Since Hooker and Thomson's reduction of *Berberis acanthifolia*, Wall. to *B. nepalensis* (=*M. napaulensis*) no one has attempted to confirm or disprove this view. The writer has examined Wallich's type specimens and has been led to the conclusion that *M. acanthifolia* should be treated as a distinct species.

Further remarks are to be found under each species.

1. **M. napaulensis,** DC. (Plates I–II, and Plate XXXIII, figs. 1–5.)

M. napaulensis, DC., Syst. ii, p. 21, 1821, excl. *β*; Ej. Prodr. i, p. 109, 1824, excl. *β Roxburghii*.

B. pinnata, Ham. ex DC., Syst. ii, p. 21, 1821.

B. miccia, Ham. ex Don, Prodr. Fl. Nepal. p. 205, 1825.

Folia 3–7-juga, jugo infimo a stipulis 1–2 cm. distante, ejus foliolis quam alia multo minoribus, late oblongis vel ovatis. Petiolus basi dilatatus ibique vaginiformis, stipulis duabus linearibus ad 8 mm. longis praeditus. Foliola coriacea, supra nitidissima subtus subnitida, oblonga vel late oblonga vel ovata, basi rotundata vel subtruncata, raro subcordato-truncata, rarius cuneato-rotundata, obliqua, 5–11 cm. longa, 3–4 cm. lata, e basi 5-nervia, venis parum elevatis subtus prominentibus, margine spinoso-dentata, spinis in latere inferiore 5–10, in superiore 4–7; foliolum terminale majus, basi rotundatum vel subcordatum. Racemi 5–7 fasciculati, 12–20 cm. longi, e basi densiflori, rhachi subcrassa. Bracteae florum oblongo-lanceolatae, tenues, 4–6 mm. longae. Pedicelli filiformes, erecto-patentes, 5–7–10 mm. longi. Sepala externa minima, oblonga vel ovato-oblonga, obtusa, 3–4 mm. longa, ad 2 mm. lata, 5-nervia, nervis lateralibus brevioribus, mediana oblongo-elliptica, obtusa, 5–6 mm. longa, circiter 3 mm. lata, 5-nervia, nervis lateralibus brevioribus, interna mediis consimilia. Petala sepalis internis paulo breviora, apice biloba, 3-nervia, basi nectariis binis distinctis praedita. Stamina edentata, connectivo triangulari, antheris filamentum fere aequantibus. Ovarium circa 5 mm. longum, stylo brevi, ovulis 4–5. Bacca desideratur.

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* Hook. f. et Thoms. in Hooker, Fl. Brit. Ind. i, p. 109, 1872.

† Fedde, l.c. p. 125.

‡ Fedde, l.c. p. 124, fig. 4, A.

Hab.—Narainhetty, Nepal (Hamilton ! 15. xi. 1802, 23. xii. 1802) ; Nepal (Wallich ! 1. 1821, No. 1480, partim). Residency Garden, Nepal. " It grows freely in the hills round Kabani " (Manners-Smith ! leaf).

Obs.—There are only a few specimens in herbaria ; one in the Kew Herbarium, one in the Wallichian Herbarium, and two in the British Museum. De Candolle's specimens are preserved in Delessert's Herbarium in Geneva. Dr. Briquet kindly consented to their being sent to the writer for examination, but owing to the war the specimens have not arrived.

2. **M. Griffithii,** Takeda, sp. nov. (Plate III.)

Folia ad 13-juga, jugo infimo a stipulis 2 mm. tantum distante, ejus foliolis quam alia multo minoribus ovatis vel subrotundatis. Petiolus stipulis duabus filiformibus ad 7 mm. longis praeditus. Foliola coriacea, supra nitidissima, subtus nitida, oblonga vel ovata 5–7 cm. longa, 2–3 cm. lata, basi cuneata vel rotundata, subobliqua, e basi 5-nervia, nervis primariis immersis, venis subinconspicuis, spinis in latere inferiore 4–5, in superiore 3–4 ; foliolum terminale paulo majus, basi rotundatum vel rotundato-cuneatum. Racemi plures quam 10, fasciculati, rhachi crassa, e basi densiflori. Flores desunt. Bracteae fructiferae minutae, longe triangulares, acutae, ad 2 mm. longae. Pedicelli crassiusculi, breves, 2–4 mm. longi, apice nutantes. Bacca ovoidea vel obovoidea, ad 10 mm. longa, stylo prominente (1.5 mm. longo) praedita, atro-coerulea, pruinosa, stigmate punctiformi 1 mm. diametro coronata.

Hab.—Bhutan (Griffith ! No. 1739, Hb. Kew, Brit. Mus.).

Obs.—The present species is very similar in appearance to the preceding one, differing however in the more numerous leaflets, the base of which is more cuneate, in the smaller triangular bracts of the inflorescence and in the shorter and stouter pedicels. There are very few specimens of this species in herbaria, and all belong to the same collection of Griffith No. 1739. Unfortunately no flower-bearing specimen has come under observation, so that it is impossible to make any conclusive comparison with *M. napaulensis.*

3. **M. pycnophylla,** (Fedde), Takeda, sp. nov. (Plate IV and Plate XXXIII, figs. 6–13.)

M. nepalensis var. *pycnophylla*, Fedde, in Engl. Bot. Jahrb. xxxi, p. 124, fig. 4, A, 1901.

Folia 5–6-juga, jugo infimo stipulis magnopere approximante, ejus foliolis quam alia minoribus ovalibus vel quadrato-ovatis. Petiolus basi dilatatus, stipulis filiformibus circa 10 mm. longis praeditus. Foliola valde coriacea, rigida, crassa, supra plus minusve nitida, subtus pallidiora, nervis prominentibus, oblonga vel ovato-oblonga, basi rotundato-cuneata vel subtruncata, obliqua, 6–10 cm. longa, 4–5 cm. lata, e basi 5-nervia, margine pauci-dentata, dentibus in latere inferiore 4–6, in superiore 2–4; foliolum terminale alia subaequans, basi rotundatum. Racemi plures fasciculati, saepe basi subramosi, densiflori. Bracteae florum ovatae vel ovato-lanceolatae, acutae, 2–4 mm. longae. Pedicelli filiformes, erecto-patentes, 5–7 mm. longi. Sepala externa ovata, obtusa, 1.5–2.5 mm. longa, ad 2 mm. lata, mediana ovalia 5–6 mm. longa, 3 mm. lata, interna elliptica, ad 7 mm. longa, 3.5 mm. lata, omnia 5-nervia. Petala elliptico-oblanceolata, 5–5.5 mm. longa, apice bifida, trinervia, basi nectarifera, nectariis binis distinctis. Stamina edentata, filamento antheris paulo longiore, apice subdilatato, connectivo triangulari. Ovarium ad 4 mm. longum, 2-ovulatum. Bacca ignota.

Hab.—Khasya (Griffith! No. 450, Hb. Kew, Brit. Mus.; Hooker and Thomson! 4000 ft., Brit. Mus.). Environs of Mamlu Punji, 4800–5000 ft. (Schlagintweit! No. 12,641, Brit. Mus.).

Obs.—As has been mentioned above, this species differs from *M. napaulensis* in the much thicker leaf, less shining and provided with fewer spines, and in the much smaller bracts.

4. **M. Roxburghii,** (DC.) Takeda, sp. nov. (Plate V and Plate XXXIII, figs. 52–57.)

M. napaulensis var. *Roxburghii*, DC., Prodr. i, p. 109, 1824.

B. pinnata, Roxb. Hort. Beng. p. 25, 1814, nomen nudum, Ej. Fl. Ind. ii, p. 184, 1832, nec Ham.

Folia 4–5-juga, jugo infimo stipulis approximante vel ad 2 cm. distante, ejus foliolis quam alia multo minoribus ovatis. Petiolus basi dilatatus, stipulis filiformibus 4–7 mm. longis praeditus. Foliola coriacea oblonga, 6–8 cm. longa, 3–4 cm. lata, supra subnitida, subtus pallidiora, basi rotundato-cuneata vel subtruncata, obliqua, e basi 5-nervia, nervis venisque prominentibus, margine sinuato-dentata, dentibus in latere inferiore 3–6, in superiore 2–5; foliolum terminale paulo majus, basi rotundatum vel rotundato-cuneatum. Racemi 4, fasciculati, ad

12 cm. longi, densiflori, rhachi tenui. Bracteae florum minutae, triangulares acutae, ca. 2 mm. longae. Pedicelli filiformes, apice plus minusve nutantes, circiter 5 mm. longi. Sepala externa ovalia, circa 4 mm. longa, 3 mm. lata, mediana oblongo-ovalia, 7 mm. longa, 4 mm. lata, interna elliptica, 8 mm. longa, ad 3 mm. lata, omnia 5-nervia vel sub 6-nervia. Petala oblonga, 7 mm. longa, apice bifida, basi nectariis binis distinctis praedita, 3-nervia. Stamina edentata, connectivo truncato, filamento antheras subaequante. Ovarium 4 mm. longum, stylo brevi, ovulis duobus. Baccam non vidi.

Hab.—In Hort. Bot. Calcutt. cult. e Manipura transmissa (Hamilton ! No. 342, in Hb. Edin., Hb. Brit. Mus. et in Hb. Wall. ! No. 1480, D.).

Obs.—Among the known Indian species this is very distinct in having the stamens with a truncate connective. The leaf and flower are very different from those of *M. napaulensis*.

5. **M. acanthifolia,** G. Don. (Plate VI and Plate XXXIII, figs. 14–23.)

M. acanthifolia, G. Don, Gen. Hist. pl. i, p. 118, 1831.

B. acanthifolia, Wall. ex Walp. Rep. i, p. 103, 1842.

Folia ad 11-juga, jugo infimo stipulis filiformibus 5–7 mm. longis magnopere approximante, ejus foliolis quam alia multo minoribus semi-orbiculatis. Foliola coriacea, supra nitida, subtus subnitida, oblonga vel oblongo-ovata, 4–7 cm. longa, 2.5–4 cm. lata, basi truncata vel subcordata, e basi 5-nervia, nervis venisque subtus prominentibus, margine pauci- et sinuato-dentata, dentibus in latere inferiore 3–5, in superiore 2–4; foliolum terminale ceteris majus, basi rotundatum. Racemi 7–12, fasciculati, densi et multiflori, rhachi crassa. Bracteae florum lanceolato-triangulares, acutae, 3–5 mm. longae. Pedicelli filiformes, apice plus minusve nutantes, 5–6 mm. longi. Sepala externa minima, late ovata, acutata, ca. 2 mm. longa et lata, 5–7-nervia, mediana ovata, obtusa, 4–5 mm. longa, ad 3 mm. lata, 5-nervia, interna oblongo-elliptica, 7–8 mm. longa, ca. 3 mm. lata, 5-nervia. Petala oblonga 6–7 mm. longa, ca. 3 mm. lata, apice bifida, basi nectariis binis distinctis majusculis praedita, trinervia, nervis lateralibus saepius subramosis. Stamina petalis breviora, filamentis apice dilatatis sed edentatis quam antherae longioribus, connectivo apiculato-triangulari. Ovarium 2–4-ovulatum, stylo fere 1 mm. longo. Bacca ovoidea, 8–10 mm. longa, stylo conspicuo coronata, nigro-coerulea, pruinosa; pedicelli subcrassati, apice nutantes.

Hab.—Nepal (Wallich ! v. 1821, No. 1480A, quoad spec. fructif.); Kumaon (R. Blinkworth !); Pundoaoh, Assam (Wallich ! 1820, No. 1480C); Darjiling (Hook. fil., No. 41;

Gamble, Nos. 8561, fl. Oct. 1880, 1032, fl. Oct. 1874, 4036B, fr. March 1877).

Obs.—Among the Indian species *M. acanthifolia* can easily be distinguished by having very small outermost sepals, apiculate-triangular connective, and large luxuriant leaf with numerous leaflets which are furnished with a few large teeth. It is also more or less related to *M. Leschenaultii* (No. 8), differing however in the nature of the leaf, in the stamens, and in the fruit.

Var. ? *Drummondii*, Takeda (Plate XXXIII, figs. 24–29).

A planta typica foliolis tenuioribus multo dentatis, sepalis medianis minoribus orbiculato-ovatis ca. 3 mm. longis, ovario 3–4-ovulato differt. Baccam non vidi.

Hab.—" Himalaya orientali ca. 6000′ s.m. prope Darjeeling " (J. R. Drummond ! x. 1904, No. 14,814, Hb. Kew).

Obs.—Only a single specimen has been examined, and it may have been collected in a shady place.

6. **M. sikkimensis,** Takeda, sp. nov. (Plate VII and Plate XXXVII, figs. 1–8.)

Folia magis quam 9-juga, jugo secundo ab infimo distante, jugo infimo stipulis subulatis ad 10 mm. longis valde approximante, ejus foliolis quam alia multo minoribus. Foliola conferta, ovata, vel oblongo-ovata, basi truncata vel subtruncata, 2.5–6.5 cm. longa (forsan nonnunquam majora), 2–3.5 cm. lata, coriacea, nervis subtus prominentibus, pauci- et grossi-dentata, dentibus in latere inferiore 3–6, in superiore 2–5 ; foliolum terminale mihi ignotum. Racemi 5 fasciculati, breves, simplices, densiflori. Bracteae ovato-oblongae, obtusae, 3–4 mm. longae, 2 mm. latae. Pedicelli cum bractea aequilongi vel paululum longiores. Sepala externa ovato-triangularia, acuta, 3.5–4 mm. longa, 1.5–2 mm. lata, trinervia, nervis lateralibus multo brevioribus, mediana oblongo-ovalia, acuta, 5-nervia, 6 mm. longa, 3 mm. lata, interna medianis similia, acuta, longitudine 7 mm. superantia, 3.5 mm. lata, ad 7-nervia, nervis lateralibus brevioribus. Petala oblongo-elliptica, apice leviter bifida, 3-nervia nervis lateralibus a basi subramosis, basi nectarifera nectariis binis oblongis conspicuis. Stamina petalis breviora, filamentis quam antherae longioribus dentibus minutis bidenticulatis, connectivo mucronato-triangulari. Ovarium angustissime ovoideum stylo brevi ovulis 4. Baccam non vidi.

Hab.—Sikkim : Latong, 7000 ft. (King's collector, May 1885, Hb. Calcutta).

Obs.—The present species comes between *M. acanthifolia* and *M. borealis* ; from the former it differs in the shape and size of the sepals and petals, from the latter it is distinguished by the characters of the stamens and leaves. It seems to be related

also to *M. manipurensis* (v. infra), from which it differs by the characteristic stamens.

7. **M. borealis,** Takeda, sp. nov. (Plate VIII and Plate XXXIII, figs. 30–46.)

Planta valde variabilis. Folia 5–9-juga, jugo infimo stipulis filiformibus usque ad 10 mm. longis valde approximante, ejus foliolis quam alia multo minoribus. Foliola chartacea vel subcoriacea, supra nitida, subtus subnitida, oblonga vel oblongo-lanceolata, 5–10 cm. longa, 1.5–3 raro 4 cm. lata, basi truncata vel rotundato-cuneata interdum subcuneata, obliqua, e basi 5-vel sub-5-nervia, venis utrinque elevatis conspicuis, margine spinoso-dentata, dentibus in latere inferiore 5–10, in superiore 5–8 ; foliolum terminale aliis simile, basi rotundatum vel rotundato-subtruncatum. Racemi 5–8 fasciculati, densi et multiflori, rhachi crassa 5–10 cm. longa. Bracteae florum ovatae vel ovato-lanceolatae, acutiusculae vel obtusae, 3–5 mm. longae. Pedicelli bracteis breviores vel demum subaequilongi, subcrassi, erecto-patentes. Sepala externa ovata vel ovato-lanceolata, acutiuscula vel obtusa, ca. 5 mm. longa, mediana oblongo-ovata, acuta vel obtusa, ca. 7 mm. longa, interna oblongo-obovata vel oblonga, obtusa, 8.5 mm. longa, omnia trinervia vel subquinquenervia. Petala oblonga, apice bifida, basi nectariis binis distinctis praedita, 5–6 mm. longa, trinervia. Stamina petalis breviora, filamento antheris longiore apice dilatato edentato (vel subdentato ?), connectivo triangulari plus minusve apiculato. Ovarium 2–4-ovulatum. Bacca subglobosa, coeruleo-nigra, pruinosa, ad 8 mm. longa, 6 mm. lata, stylo 1 mm. longo ornata.

Hab.—North-west of India (Royle ! defl.). Kumaon : Binsao, 7000 ft. (Strachey and Winterbottom ! No. i (fr. fl.)* ; Dehra Dun (G. King ! fl. fr. Hb. Calcutt.) ; Jodi Forest in Jaunsar, 6000 ft., " common in moist places and under oak forest " † (Keshava Nand ! iii. 1890, No. 73, fl.) ; Garwhal : Massouree, 4000–7000 ft. (Stewart ! Jameson ! 16. iv. 1845) ; 5000–7000 ft. (Edgeworth ! 1844, fr.) ; Landour (Captain Vicary ! 1831, No. 42, defl.) ; Kashmir : Chamba Pass, 6000–7000 ft. (G. Watt ! v. 1878, No. 540, fl.) ; Chil to Dalhousie, 5000–7000 ft. (Lace ! xi. 1896, No. 1308, fl.).

Obs.—The present species is characterised by the oblong leaflets of rather thin texture with prominent veinlets, large bracts, short pedicels, and subglobose fruits. Its distribution is confined to the north-western parts of India.

The writer has seen a plant of a similar appearance to this species but differing in the possession of larger leaflets and longer pedicels (5–8 mm. in length). The racemes are also longer (over 20 cm.) and more numerous in the fascicle. As neither flowers nor ripe fruits are present in the specimens, a closer examination has been impossible.

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* The stamen of this specimen is subdentate, and the innermost sepal is not much larger than the middle one. Figs. 41–46.

† According to the collector the vernacular name of this plant is " Khoru."

Hab.—Massouree (without collector's name, iii. 1895 ? Hb. Kew) ; Saharampore garden (Jameson ! No. 421, Hb. Edin.).

8. **M. manipurensis,** Takeda, sp. nov. (Plate IX and Plate XXXIII, figs. 47–51.)

Folia 5–9-juga, jugo infimo stipulis filiformibus ad 7 mm. longis valde approximante, ejus foliolis minoribus quadrato-oblongis. Foliola coriacea, supra nitida, subtus subnitida, ovata vel late ovata, 3–6 cm. longa, 2–3 cm. lata, basi subtruncata vel truncata vel plus minusve cordata, e basi 5- vel sub-6-nervia, nervis plus minusve prominentibus, margine pauci-sinuato-dentata, dentibus in latere inferiore 3–5, in superiore 2–4 ; foliolum terminale paulo majus, basi rotundatum. Racemi 5–8 fasciculati, ad 10 cm. longi, densiflori, rhachi subcrassa. Bracteae florum ovatae, acutiusculae, conspicuae, ad 5 mm. longae. Pedicelli filiformes, sub anthesin erecto-patentes, 5 mm. haud excedentes. Sepala externa ovata, acutiuscula, 4 mm. superantia, 2 mm. lata, mediana oblongo-ovalia, obtusa, ca. 7 mm. longa, 4 mm. lata, interna elliptica vel oblongo-obovalia, 8–9 mm. longa, 4 mm. lata, omnia 3–5-nervia. Petala oblongo-ovalia, apice bifida, basi nectariis binis distinctis praedita, 7 mm. longa, 3.5 mm. lata, trinervia. Stamina edentata, connectivo depresso-triangulari, antheris filamento paulo brevioribus. Ovarium 4 mm. longum, stylo brevissimo praeditum, 1–2-ovulatum. Bacca ignota.

Hab.—Manipur : Kassonie range on the frontier of Burma, 6000 ft. (Watt ! No. 5956) ; Sirohifurad, N.E. ranges, 8000 ft. (Watt ! No. 6472). Typus in Hb. Kew et Edinb.

Obs.—In general appearance the present species seems to possess the leaf of *M. acanthifolia* and the flower of *M. borealis.*

9. **M. Simonsii,** Takeda, sp. nov. (Plate X and Plate XXXVII, figs. 9–15.)

Folia 6–9-juga, jugo infimo stipulis valde approximante, ejus foliolis quam cetera multo minoribus, jugo secundo ab infimo distante. Petiolus brevissimus, basi dilatatus, stipulis binis filiformibus ad 5 mm. longis praeditus. Foliola subcoriacea, utraque pagina flavido-subnitida, venis venulisque conspicuis, lanceolata, longe acuminata, basi rotundato-subcuneata, 7–11 cm. longa, 2–3 cm. lata, margine serrato-dentata, dentibus in latere inferiore 6–10, in superiore 5–8 ; foliolum terminale aliis aequale vel longius, basi cuneato-rotundatum. Racemi 8 fasciculati, rhachi subcrassa, ad basim pauci-ramosi, sublaxiflori. Bracteae minutae, 1.5–2.5 mm. longae, triangulares, acutae. Sepala externa minima, elliptico-ovata, obtusiuscula, trinervia, nervis lateralibus mediano brevioribus, 2 mm. longa, 1.5 mm. lata, mediana elliptico-oblonga, obtusa, trinervia, nervis lateralibus brevioribus, ca. 5 mm. longa, 2 mm. lata, interna oblongo-obovata, trinervia, ad 7 mm. longa, 2.5 mm. lata. Petala oblonga, cum sepalis medianis aequilonga, apice bifida, basi nectarifera nectariis binis minutis, trinervia, nervis lateralibus subramosis. Stamina petalis paulo breviora, filamentis edentatis quam antherae paulo longioribus, connectivo anguste quadrato apice emarginato-truncato. Ovarium anguste ellipsoideum, 3-ovulatum, stylo brevi. Bacca ignota.

Hab.—Khasya Hills (Simons ! Nov. 1850, Hb. Calcutt.).

Obs.—A very distinct species amongst the Indian Mahonias. The leaf somewhat resembles that of *M. borealis*, but the structure of the flower, particularly of the stamens, is very different.

10. **M. Leschenaultii,** (Wall.) Takeda, comb. nov. (Plate XI and Plate XXXIV, figs. 58–82.)

B. Leschenaultii, Wall. ex Wight et Arn., Prodr. Fl. Pen. Ind. Or. i, p. 16, 1834 ; Wight, Icon. Pl. Ind. Or. tab. 940, 1840–56.

B. nepalensis var. *Leschenaultii*, Hook. f. et Thoms. in Hook. f., Fl. Br. Ind. i, p. 109, 1875.

M. nepalensis var. *Leschenaultii*, Fedde, in Engl. Bot. Jahrb. xxxi, p. 123, 1901.

Planta robusta. Folia 7–10-juga, jugo infimo stipulis filiformibus ca. 10 mm. longis approximante, ejus foliolis minoribus. Foliola coriacea vel chartaceo-coriacea, supra nitidissima, subtus subnitida, oblonga vel late oblonga, 3–9 cm. longa, 2–5 cm. lata, basi rotundato-subtruncata vel truncata, venulis prominentibus, margine spinoso-dentata, spinis in latere inferiore 4–8, in superiore 3–6 ; foliolum terminale vix vel non majus, basi rotundatum. Racemi plures fasciculati, saepe robusti et 30 cm. superantes, simplices vel raro subramosi, rhachi crassa, e basi ad apicem multiflori. Flores laxiusculi, longe pedicellati, pedicellis gracilibus erecto-patentibus ca. 10 mm. longis, bracteis late ovatis obtusis 3–4 mm. longis 2–3 mm. latis. Sepala externa late ovata, obtusa, ad 3 mm. longa et lata, mediana oblongo-ovata vel ovalia, obtusa, 4–5 mm. longa, 3–4 mm. lata, interna oblongo-ovalia, obtusa, 6–7 mm. longa, ca. 4 mm. lata, omnia 5–7-nervia, nervis plerumque subramosis. Petala oblongo-ovalia, 5–6 mm. longa, 3 mm. lata, plerumque 5-nervia, nervis subramosis, apice biloba, basi nectariis distinctis parvis praedita.

Stamina brevia, filamentis crassis apice bidentatis cum antheris subaequilongis, connectivo crasso depresso-triangulari. Ovarium 3–4 mm. longum, stylo 1 mm. longo coronatum, 5–6-ovulatum. Bacca globosa, subnutans, 7–10 mm. diametro, stylo crasso distincto 1 mm. superante coronata.

Hab.—Nilghiri (Wallich ! No. 1479 ; Gardener ! 1847 ; Hohenacker ! No. 1125 ; Wight ! Nos. 49, 50 ; ex Hb. Ball Comm. G. S. Gough ! ; W. A. ! No. 53 ; Carcorr Ghat (G. King ! No. 1279B, fr.) ; Anamallaya hills (Beddome ! No. 177) ; Tinnevelly hills (Beddome ! No. 178) ; Ootacamund, 7500 ft. (Gamble ! No. 12,443, fl. Sept. 1883) ; Sholas on Kundahs, 7000 ft. (C. E. C. Fischer ! No. 2546, Feb. 1911) ; Minchiguli, 4800 ft. (C. E. C. Fischer ! No. 976, fl.).

Obs.—A very distinct species amongst the Indian Mahonias in the globose berry which is furnished with a long style and borne on a slender pedicel, in the short thick stamen with a dentate filament, and in the short but broad sepals and petals which are thick in consistency and are strongly veined.

The present species occurs in the Nilghiri hills where it is found in abundance.

The writer has also examined in the Kew Herbarium a sterile specimen from Bhutan which possesses leaflets elliptical-oval, cuspidate-acuminate, margins incrassate and furnished with 8–12 shallow teeth on both sides. This is possibly a good distinct species, but owing to the lack of material it is left unnamed for the present. As far as the character of leaf goes it comes near *M. Veitchiorum*, a Chinese species, but differs from the latter in several respects.

II. THE CHINESE SPECIES.

The first record of Chinese species of this genus was made by R. Fortune who paid repeated visits to China during eighteen years from 1843. The first species discovered by this diligent collector was M. *Fortunei*,* and soon afterwards *M. Bealei* † and the so-called *M. trifurca* ‡ were found. In 1882 Hance recorded the occurrence of *M. napaulensis* in Szechwan, where Mesny collected a specimen in 1880.§ *M. Bealei* was subsequently reduced by Hemsley to *M. napaulensis*, and since *M. trifurca* is entirely ignored by this author, there are only two species of this genus enumerated in Index Floræ Sinensis.* An examination of the specimen referred to by Hance shows that the record is an erroneous one, since the specimen consists of a rather abnormal leaf of *M. Fortunei.* Another specimen referred to *M. napaulensis* by Hemsley (l.c.) is also *M. Fortunei.* A third specimen similarly referred by the same botanist on the authority of Maximowicz is very unlikely to be the true *M. napaulensis*, DC. The third record of *M. napaulensis* occurring in China is that of Franchet.† The writer has had no opportunity of examining Delavay's specimen, but suspects that the identification was incorrect.

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* *Berberis Fortunei*, Lindl. in Journ. Hort. Soc i, pp. 231, 300, cum ic. xylogr., 1846.

† *Berberis Bealei*, Fort. in Gard. Chron. 1850, p. 212.

‡ *B. trifurca*, Fort. in Lindl. et Paxton, Flower Gard. iii, p. 57, fig. 258, 1852–53.

§ Hance, in Journ. Bot. n.s. xi, p. 2, 1882.

M. Bealei is fairly well characterised by Sir W. J. Hooker in the Botanical Magazine,‡ and is a good distinct species. This is however another plant which has been much confused with allied species.

Very little is known about *M. trifurca.* The writer is of opinion that this is an extreme form of *M. Fortunei*, since the latter species sometimes has broad leaflets with few teeth. For further discussion see under *M. Fortunei.*

In 1887 Oliver published a description with figures of a very distinct species under the name of *Berberis gracilipes*,§ which has again been described by Franchet as *B. subtrinervis.*||

Later, Fedde,¶ Hemsley and Wilson,** Léveillé,†† Sprague,‡‡ and Schneider §§ have added more new species. The present writer recognises twenty-five species including his eight new species. In the following pages full descriptions of all the new species and of some inadequately described species will be given. There are six species, the specimens of which have not been at the writer's disposal, and on these no discussion has been attempted.

1. **M. Bealei,** Carr. (Plates XII–XIII and Plate XXXIV, figs. 83–103.)

M. Bealei, Carr. in Fl. des Serres, x, p. 166, 1854–55.

B. Bealei, Fort. in Gard. Chron. 1856, p. 212; Hook., Bot. Mag. ser. 3, xi, sub. tabb. 4848, 4852, 1855.

B. Bealei var. *planifolia*, Hook. ibid. sub tab. 4846, 1855.

B. japonica, Lindl. in Lindl. et Paxt. Fl. Gard. i, p. 11, fig. 2, 1850–51, non R. Br.

M. japonica, Fedde, l.c. p. 118, partim, excl. syn.

M. japonica var. *Bealei*, Fedde, l.c. p. 119, fig. 3, B.

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* Forbes et Hemsl. Index Fl. Sin. i, p. 31, 1886.

† Franch. Pl. Delav. i, p. 35, 1889.

‡ Bot. Mag. sub tabb. 4846, 4852, 1855.

§ Oliver, in Hook. Ic. Pl. ser. 3, viii, tab. 1754, 1888.

|| Franch. in Bull. Mus. Hist. Nat. Par. i, p. 63, 1895.

¶ L.c.

** Kew Bull. 1906, p. 152.

†† Fedde, Repert. vi, p. 372, 1909.

‡‡ Kew Bull. 1912, p. 389.

§§ Pl. Wilsonianae, 1913.

Planta robusta variabilis. Folia 5-9-juga, jugo infimo a stipulis paulo distante, ejus foliolis minoribus. Stipulae deficientes vel obsoletae vel raro bene evolutae ad 10 mm. longae. Foliola coriacea, crassa, inter se distantia vel valde approximata, quadrato- vel oblongo-ovata, raro ovato-deltoidea, basi aut truncata aut rotundato-cuneata, apice cuspidata, margine saepius revoluta, plerumque pauci-dentata, dentibus in latere inferiore 3–5–8, in superiore 2–4–6, supra nitida, flavido-viridia, nervis venisque vix vel paulo conspicuis, subtus opaca, nervis venisque elevatis; foliolum terminale aliis simile vel paulo majus. Racemi 6–15 fasciculati, simplices, densi- et multi-flori, rhachi crassa 8–15 cm. longa. Bracteae florum ovatae, acutatae, squamiformes, 2–3 mm. longae, ad 2 mm. latae. Flores flavi vel initio rubicundi, pedicellati, pedicellis filiformibus usque ad 6 mm. longis fructiferis nutantibus. Sepala externa ovata, acutata vel obtusa, 2–2.5 mm. longa, 1.5–2.5 mm. lata, 5-nervia, mediana ovalia, 4–6 mm. longa, 5-nervia, interna ovalia vel oblongo-ovalia, 5–8 mm. longa, 3–4 mm. lata, 5-nervia. Petala cum sepalis internis subaequilonga, apice bifida, basi nectariis binis distinctis praedita, 3-nervia. Stamina petalis breviora, filamento apice dilatato sed edentato antheris subduplo longiore, connectivo depresso-triangulari. Ovarium oblongo-ovoideum, 2- vel 3–4-ovulatum, stylo brevissimo, stigmate punctiformi. Bacca ovoidea, coeruleo-nigra, pruinosa, ca. 10 mm. longa, 6 mm. lata.

Hab.—Hupeh: Ichang (Henry! No. 3283, fl. No. 3250, alabastr.); Nant'o (Henry! No. 3913, defl.); Patung (Henry! No. 1450 fl.). Szechwan: Omeisan (Hugh! 1899). Kwantung: North River (Comm. Ford! No. 17, native collect., xi. 1888, fr.).

Obs.—Hooker distinguishes var. *planifolia* as having subdeltoid leaflets which are subimbricate and have a truncate base, and smaller flowers. In the course of the present study it was often found that the small-flowered form possesses two ovules whereas the "typical" form has 3–4 ovules. This character was not found to be constant. There is no difference whatever in the nature of the leaflets, although this was regarded by Hooker as the main point of distinction. All the specimens from China have been found to belong to the so-called var. *planifolia*, as they have small flowers and usually 2 ovules. So far no specimens of the large-flowered form collected in China have come under observation. Hooker's original specimens of these two forms sent from Messrs. Standish and Noble consist of leaf only, so that it is impossible to investigate these further. The leaf of the "type" form is however a rather abnormal one, having leaflets with cuneate base, whereas that of the var. *planifolia* represents a normal leaf of *M. Bealei*. It appears

therefore that var. *planifolia* really represents the typical form of this species, whereas the so-called type has been derived from a garden form. As there exists no definite difference between the two, there is no necessity to keep up the varietal name. For a comparison see the flowers delineated in our Plate XXXIV, figs. 83–103.

The only fruit-bearing specimen of this species from China, which is reproduced in our Plate XIII, appears at the first glance to be rather different from the ordinary form of *M. Bealei.* The writer is however of opinion that this is a form of our species bearing young berries. The nature of the inflorescence agrees very well with that of the typical form of *M. Bealei.*

The present species is frequently cultivated in this country and usually called *M. japonica* by florists. Although Fedde has united *M. Bealei* with *M. japonica,* these two species are very distinct, and there is no reason for confusing them.* The points of distinction will be mentioned under *M. japonica.*†

2. **M. flavida,** Schn. (Plate XIV and Plate XXXIV, figs. 104–109.)

M. flavida, Schn. in Sarg. Pl. Wilson. i, p. 382, 1913.

Adde notas sequentes :—Folia 60 cm. longa, 8-juga, foliolo terminali aliis subduplo longiore basi cuneato. Racemi usque ad 22 cm. longi, basi ramosi, rhachi sub-crassa, bracteis florum ovato-lanceolatis acutis acuminatisve rubro-brunneis 5–6 mm. longis. Sepala subcoriacea, externa ovato-deltoidea, acutiuscula, crassa, margine hyalina, nervis inconspicuis, fere 2 mm. longa et lata, mediana oblongo-ovalia, margine plus minusve hyalina, 3-nervia, 3 mm. longa, 2 mm. lata, interna obovato-oblonga, apice rotundata, 5-nervia, 6 mm. longa, 3 mm. lata. Ovarium 5-ovulatum.

Hab.—Yunnan : "Mengtz, mts. to S.E. 5000 ft., shrub 8 ft., yellow flowers" (Henry ! No. 10,180, Hb. Kew).

3. **M. Fordii,** Schn. (Plate XV and Plate XXXIV, figs. 110–115.)

M. Fordii, Schn., l.c. p. 383.

Adde notas sequentes :—Racemi 5–8 fasciculati, usque ad 15 cm. longi, rhachi gracili, bracteis florum minutis ovatis acutiusculis 2 mm. longis pedicellis gracilibus ad 5 mm. longis sub anthesin apice saepe nutantibus. Sepala 9, in cyclos tres disposita, externa ovalia, acuta, 3-nervia, 2 mm. longa, mediana late ovalia, obtusa, 5-nervia, 3.5 mm. longa, interna elliptica, 5-

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* Hooker (Bot. Mag. sub tab. 4846) was the first to suggest the possible identity of these two species, but he left the matter undecided.

† See p. 241 of the present paper.

nervia, 4–4.5 mm. longa. Stamina filamento apice edentato nec dilatato sed leviter constricto antheris paulo longiore, connectivo truncato. Bacca obovoidea, 6–7 mm. longa, nigrocoerulea, pruinosa, stylo brevissimo coronata.

Hab.—Kwangtung: North River (native collector! xi. or xii. 1888, ex Hb. Hongkong, No. 17 addition to the No. 17 sent to Kew in Feb. 1889.*

4. **M. Mairei,** Takeda, sp. nov. (Plate XVI and Plate XXXV, figs. 116–120.)

Folia 6-juga, jugo infimo stipulis filiformibus ca. 10 mm. longis magnopere approximato, ejus foliolis aliis triplo vel quadruplo minoribus, jugo secundo ab infimo valde distante. Foliola oblonga, 7–10 cm. longa, 2.5–4 cm. lata, basi obliqua, apice plus minusve cuspidata, margine spinoso-dentata, dentibus in latere inferiore 7–12, in superiore 5–9, a basi 5-nervia, supra nitidissima, nervis depressis, venis reticulatis elevatis conspicuis, subtus nitida, nervis elevatis; foliolum terminale paulo majus, basi rotundato-cuneatum. Racemi 6–7 fasciculati, basi subramosi, rhachi crassa ad 20 cm. longa. Bracteae florum oblongo-ovatae, acutae, 3–4 mm. longae, patentes vel reflexae. Pedicelli filiformes, erecto-patentes, 5 mm. longi, basi saepe prophyllis filiformibus ornati. Sepala externa ovato-deltoidea, obtusa, crassiuscula, 5-nervia, nervis inconspicuis, 2 mm. longa et lata, mediana ovato-orbicularia, apice subrotundata, 4 mm. longa, 3.5 mm. lata, interna oblongo-ovalia, obtusa, 3–5-nervia, nervis subramosis, 7 mm. longa, 4 mm. lata. Petala oblongo-elliptica, apice bifida, basi nectariis binis distinctis instructa, trinervia, nervis subramosis. Stamina (juvenilia) edentata, connectivo conico apice subtruncato, antheris cum filamento subaequilongis vel paulo brevioribus. Ovarium cum stylo brevi 3.5 mm. longum, 4–5 ovulatum, stigmate 1 mm. diametro.

Hab.—Yunnan: vicinity of Yunnan-sen (Maire! No. 101, Hb. Edinb.).

Obs.—This species is closely related to *M. flavida,* Schn. but differs in the looser and paler inflorescence, smaller less pointed and often reflexed bracts, conical but truncate connective, and in the occasional presence of prophylls on the pedicel.

5. **M. bracteolata,** Takeda, sp. nov. (Plate XVII and Plate XXXV, figs. 121–125.)

Folia 3-7-juga, jugo infimo a stipulis filiformibus ca. 10 mm. longis 5–12 mm. distante, ejus foliolis multo minoribus ovatis vel subrotundatis. Foliola oblonga vel oblongo-lanceolata, crassa, firmissima, 3–7 cm. longa, 1.5–2 cm. lata, basi truncata vel rotundato-truncata, utrinque dentibus 5–12 spinoso-dentata, supra pallide viridia, venis elevatis, subtus pallidiora, subglauca, nervis inconspicuis; foliolum terminale paulo majus, basi rotundatum vel subtruncatum. Racemi plures, ad 10 cm. longi, densiflori, basi ramosi ibique non floriferi, rhachi gracili sed firma plus minusve pruinosa. Bracteae florum ovatae vel ovato-lanceolatae, acuminatae, 3–4 mm. longae, saepe rubellae. Flores juveniles erubescentes, longe pedicellati, pedicellis erectis 5–10 mm. longis in fl. basilaribus medianisque bracteolatis, bracteolis 1–2 bracteae similibus sed minoribus. Sepala externa ovato-deltoidea, acuta, 3 mm. longa, 2.5 mm. lata, mediana ovata, obtusa, 5 mm. longa, 3.5 mm. lata, interna oblongo-ovalia, 8 mm. longa, 4 mm. lata, omnia 5-nervia, nervis subramosis. Petala oblongo-elliptica, apice leviter retusa, 3-nervia, nervis lateralibus basi subramosis, nectariis binis distinctis ornata. Stamina filamento crasso edentato antheras subaequante, connectivo depresso-deltoideo. Ovarium cum stylo (1 mm. superante) 5 mm. longum, 6–8-ovulatum. Bacca desideratur.

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* Cf. under *M. Bealei.*

Hab.—Yunnan: "dry open situations on the margins of pine forests on the divide between the Hoching and Lichiang valleys, 7000–9000 ft. Lat. 26°45′ N. Spinous-leaved shrub of 3–7 ft. Flowers bright yellow tinged purplish-rose in bud, fragrant" (Forrest! No. 7364, Hb. Edinb.).

Obs.—A very distinct species well characterised by the conspicuous prophylls and thick tough leaflets.

6. **M. dolichostylis,** Takeda, sp. nov. (Plate XVIII and Plate XXXV, figs. 126–130.)

Folia ad 8-juga, jugo infimo stipulis subulatis usque ad 15 mm. longis maxime approximato, ejus foliolis valde minoribus. Foliola firmissime coriacea, oblonga vel oblongo-ovata, 6–8 cm. longa, 3–5 cm. lata, basi obliqua, margine plus minusve revoluta, spinoso-dentata, dentibus in latere inferiore 4–7, in superiore 3–4, raro numerosioribus, flavido-viridia, supra subnitida, nervis impressis venis reticulatis, subtus pallidiora, nervis elevatis, venis inconspicuis; foliolum terminale aliis paulo majus vel subaequale, basi cuneatum. Racemi plures, multi- et densiflori, 20 cm. longi vel ultra, rhachi crassa. Bracteae florum oblongae vel oblongo-ellipticae, obtusae, deflexae, sub anthesin 3 mm. longae, deinde valde accrescentes et usque ad 9 mm. longae, 3 mm. latae. Pedicelli 5 mm. longi, crassiusculi, erecti vel erecto-patentes. Sepala externa ovata, acuminata, 4 mm. longa, 3 mm. lata, subquinquenervia, mediana late ovalia, obtusa, 5 mm. longa, 3 mm. lata, 5-nervia, interna oblonga, obtusa, ad 9 mm. longa, 4 mm. lata, 5-nervia, nervis saepe subramosis. Petala anguste oblonga, apice leviter bifida, lobis in specimine nostro convergentibus, basi nectariis binis distinctis ornata, 3-nervia, 9 mm. longa, 3 mm. lata. Stamina filamento apice incrassato edentato antheris longiore, connectivo triangulari apice subemarginato-truncato. Ovarium ellipsoideum, stylo 3 mm. longo vel paulo ultra coronatum, 4-ovulatum. Bacca juvenilis globosa, matura ignota.

Hab.—Yunnan: vicinity of Yunnan-sen (Maire! No. 2003, Hb. Edinb.).

Obs.—A species well marked by the robust foliage and long styles.

7. **M. conferta,** Takeda, sp. nov. (Plate XIX and Plate XXXV, figs. 131–135.)

Folia 7–20-juga, jugo infimo stipulis subulatis patentibus vel deflexis ca. 10 mm. longis magnopere approximato, ejus foliolis quam alia valde minoribus. Foliola coriacea, rigida, valde conferta, oblonga vel ovato-oblonga, plus minusve falcata, 3–6 cm. longa, 2–3 cm. lata, basi truncata vel rotundato-truncata, utraque pagina nitidissima, supra flavido-viridia, nervis plus minusve impressis, subtus pallidiora nervis venisque elevatis, margine pauci-sinuato-dentata, dentibus in latere inferiore 3–4, in superiore 2–4; foliolum terminale aliis majus, basi rotundatum vel cordato-rotundatum. Racemi, ut videntur, pluri-fasciculati, simplices, ad 18 cm. longi, rhachi crassa, multi- et densi-flori. Flores pro genere magni, aurei. Bracteae florum ovatae, acutae, ca. 5 mm. longae, leviter carinatae, subcoriaceae. Pedicelli bracteis longiores, erecto-patentes, demum recurvo-patentes, subcrassi. Sepala externa ovata vel oblongo-ovata, obtusa, ad 3 mm. longa, subquadrinervia, mediana late elliptica, 5 mm. longa, 3 mm. lata, subquinquenervia, interna oblongo-ovalia, 9 mm. longa, 4 mm. lata, 5-nervia. Petala sepalis internis paulo breviora, oblongo-spathulata, 3-nervia, apice bifida, basi nectariis binis ellipticis conspicuis ornata. Stamina 5 mm. longa, filamento apice subdilatato edentato cum antheris subaequilongo, connectivo late triangulari obtuso-apiculato. Ovarium anguste ovoideum, cum stylo conspicuo 5 mm. longum, stigmate 1 mm. diametro, 3-ovulatum. Baccam non vidi.

Hab.—Yunnan: "Fen chen Lin, mt. forests, 6500 ft., shrub 4 ft., yellow flowers" (Henry! No. 10,180A, Hb. Kew, Edinb.).

Obs.—A very handsome plant, worth cultivating. It is easily distinguished from any other species of this genus by its beautiful foliage and large flowers which are densely crowded in the raceme.

8. **M. Hancockiana,** Takeda, sp. nov. (Plate XX and Plate XXXV, figs. 136–140.)

Folia 4–6-juga, infimo jugo a stipulis filiformibus ad 15 mm. longis distante, ejus foliolis quam alia dimidio minoribus ovatis. Foliola subcoriacea, elliptica, 5–6 cm. longa, 2–3 cm. lata, inter se distantia, basi rotundato-cuneata, margine spinoso-serrata, dentibus in latere inferiore 7–12, in superiore 4–6, supra atro-viridia, opaca, nervis depressis, subtus pallida, nervis venisque elevatis; foliolum terminale aliis majus, basi cuneatum vel rotundato-cuneatum. Racemi 15 cm. superantes, simplices, sublaxiflori. Bracteae florum membranaceae, ovatae, subcuspidato-acutae, 3 mm. longae. Pedicelli filiformes, erecto-patentes, 5 mm. longi, graciles. Sepala externa ovata, obtusa, 3–4-nervia, 2.5 mm. longa, mediana ovato-elliptica, 5-nervia, 5 mm. excedentia, interna late-oblanceolata, 7 mm. superantia, 7-nervia. Petala elliptica, retusa, 6 mm. longa, basi nectariis binis conspicuis ornata, 3-nervia, nervis lateralibus subramosis. Stamina 4.5 mm. longa, filamento edentato antheris longiore, connectivo quadrato-triangulari crasso. Ovarium cum stylo crasso 5 mm. longum, 3–5-ovulatum. Bacca ignota.

Hab.—Yunnan: Mengtsz, in forest 9000–9500 ft., shrub, flowers rich yellow (Hancock! ii. 1894, No. 151, Hb. Kew).

Obs.—A distinct species having comparatively small leaves with elliptical leaflets which are distantly disposed.

9. **M. lomariifolia,** Takeda, sp. nov. (Plates XXI–XXII and Plate XXXV, figs. 141–151.)

Folia multijuga, jugis 10–20, jugo infimo stipulis subulatis patentibus valde approximato, ejus foliolis quam alia multo minoribus ovatis vel subrotundatis basi saepe subcuneatis. Foliola inter se subdistantia, basilaria oblongo-ovata, mediana et superiora lanceolata vel late lanceolata, longe cuspidato-acuminata, patentia vel erecto-patentia, saepe falcata, 4–7 cm. longa, 1–2 cm. lata, basi truncata vel rotundato-truncata, plus minusve obliqua, coriacea vel subcoriacea, supra nitida nervis vix prominentibus (in specc. in locis umbrosis nascentibus venis subelevatis), subtus pallidiora, nervis conspicuis, venis subobscuris, margine incrassata, leviter revoluta, distanter spinoso-dentata, dentibus in latere inferiore 3–6, in superiore 2–4; foliolum terminale aliis longius, basi rotundatum vel rotundato-cuneatum. Racemi 8–17 fasciculati, simplices, basi saepe bracteis sterilibus vestiti, densi- et multi-flori, rhachi crassa substricta. Bracteae florum ovato-lanceolatae, acutae. Pedicelli filiformes, bracteas superantes, nutantes, saepe pruinosi. Sepala externa ovata vel oblongo-ovata, obtusa, ca. 2 mm. longa, mediana ovato-elliptica, obtusa, 6 mm. longa, interna elliptica vel ovato-elliptica, ad 8 mm. longa, omnia 3–5-nervia. Petala oblongo-elliptica, sepalis internis paulo breviora, trinervia, apice leviter bifida, basi nectariis binis oblongis ornata. Stamina filamento antheris duplo longiore apice subdilatato edentato, connectivo triangulari apiculato. Ovarium elongatum, ca. 5 mm. longum, stylo brevi, ovulis 2–3–4–5. Bacca ovoidea, 6–7 mm. longa, pruinosa.

Hab.—Yunnan: " hills to the east and north of Tengyueh, 7000–8000 ft. Spinous-leaved shrub of 4–8 ft. Flowers bright yellow, non-fragrant. Shady moist gullies " (Forrest ! xi. 1912, No. 9244, fl., v. 1912, No. 7724, fr.; Hb. Edinb.); " Mekong and side valleys at an elevation of from 8000 to 12,000 ft. Shrub of from 4 to 12 ft. Fl. bright yellow " (Forrest ! ix. 1904, No. 141, alabastr., Hb. Edinb.); " Milê district, in mountain wood. Shrub 6 ft., yellow flowers " (Henry ! No. 10,309).

Obs.—A very distinct species easily recognised by its multijugous leaves which resemble some species of *Lomaria*. The above description of the flower has been taken mainly from the specimen collected by Forrest (No. 9244), which possesses fully developed flowers. The other specimens examined have either young flowers or flower buds.

The same species has been collected in Formosa. Remarks upon the Formosan specimens will be found on p. 238.

10. **M. Veitchiorum,** (Hemsl. et Wils.) Schn. (Plate XXIII and Plate XXXV, figs. 158–162.)

M. Veitchiorum, Schn. in Sargent, Pl. Wils. i, p. 383, 1913.

B. Veitchiorum, Hemsl. et Wils. in Kew Bull. 1906, p. 152.

Adde descr. Folia ad 7-juga, foliolis in infimo jugo multo minoribus stipulis brevissimis magnopere approximatis. Racemi 6–8 fasciculati, ad 10 cm. longi vel ultra, rhachi crassa. Bracteae florum majusculae, lanceolatae, longe acuminatae, 10 mm. superantes, pedicellis triplo majores. Sepala 9 in cyclos tres disposita, externa oblongo-lanceolata, acuta, 5-nervia, 5.5 mm. longa, mediana oblongo-elliptica, 6 mm. superantia, 5-nervia, interna oblongo-ovata, obtusa, 5–7-nervia, 7 mm. longa. Petala late oblanceolata, leviter bifida, basi nectariis binis magnis ornata, 5-nervia. Stamina petalis breviora, filamento ad apicem versus subdilatato edentato antheris subduplo longiore, connectivo subtruncato.

Hab.—Szechwan: loco non indicato (Henry ! No. 8993, fr.); Mt. Omei (Wilson ! Nos. 3142, fl., 4725, fl.). Yunnan: " Hills to the east of Tengyueh, 6000–7000 ft. Spinous-leaved shrub of 3–5 ft. Flowers golden-yellow ? In fruit. Amongst scrub in open situations in side valleys " (Forrest ! No. 7890); " Ma-

chang-kai valley, north of Tengyueh, 6000–7000 ft. Spinous-leaved shrub of 4–8 ft. Flowers bright-orange-yellow, fragrant. Open shady situations on the margin of forests" (Forrest! No. 9756).

Obs.—A well characterised species, having thick elliptical leaflets with small spinous serration on the margin, very long bracts, and large outer sepals. This species may have some relationship with *M. polyodonta*, as Schneider considers, but is a stouter plant in every respect.

11. **M. Fortunei,** (Lindl.) Fedde. (Plate XXIV and Plate XXXVI, figs. 163–167.)

M. Fortunei, Fedde in Engl. Bot. Jahrb. xxxi, p. 130, pro parte, fig. 3, E, 1901; Schn. in Sargent, Pl. Wils. i, p. 380, pro parte, 1913.

B. Fortunei, Lindl. in Journ. Hort. Soc. i, pp. 231, 300, c. ic. xylogr. 1846; Forbes et Hemsl. Ind. Fl. Sin. i, p. 31, 1886.

M. trifurca, Hort. ex Loudon, Encycl. Pl. Suppl. ii, p. 1346, 1855; Fedde, l.c. p. 125, fig. 4, B.

B. trifurca, Fort. in Paxt. and Lind. Fl. Gard. iii, p. 57, fig. 258, 1852–53.

B. japonica var. *trifurca*, Rehd. in Mitteil. d. Deutsch. Dendrolog. Gesellsch. 1912, p. 184.

B. nipalensis, Hance in Journ. Bot. n.s. xi, p. 2, 1882, nec Spr.

Hab.—China: (Fortune! Nos. 32 (1846), 42 (1852), 43 (no date). Szechwan: Chung-king (Mesny! 1880, in Hb. Hance, No. 2287); Mt. Omei and Min River (Faber! No. 469); Mt. Omei (Hugh! 1899); Yachou Fu, woodlands, 500–800 met. (Wilson! No. 2882).

Obs.—This species is variable as regards the shape and size of leaflets. In the more normal specimens the leaflets are narrow, gradually tapering towards the base. Sometimes the leaflets are much broader (over 2 cm.) and are furnished with a few coarse teeth (Faber, No. 469).* The terminal leaflet is usually longly cuneate at the base, but occasionally a leaflet with roundish base is met with (Fortune, No. 42). Where very few teeth are present in a broad leaflet, we get the so-called "*trifurca*," which is only an extreme form (e.g. the terminal leaflet in Fortune, No. 42). There seems however to be no necessity to keep up this name, since there are all gradations. The terminal leaflet is as a rule "sessile," but in one case the writer has seen a terminal leaflet stalked (Mesny in Hance, No. 2287). This is probably due to the fact that the terminal one is fused with those of the uppermost pair; in this case the terminal leaflet possesses a round base.

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* Fortune, No. 42 possesses leaflets up to 5 cm. broad with round or almost truncate base; the teeth on the margin are very coarse.

12. **M. confusa,** Sprague. (Plate XXV and Plate XXXVI, figs. 168–172.)

M. confusa, Sprague, in Kew Bull. 1912, p. 339, 1914, p. 232; Takeda, ibid. 1915, p. 128.

M. Fortunei, Fedde, l.c. p. 130, pro parte; Schn. l.c. p. 380, pro parte.

M. Zemanii, Schn. l.c. p. 378, 1913.

Hab.—Chung Ching (Chüng tsing in Shensi?) (Bourne! fr.). Hupeh: Ichang and immediate neighbourhood (Henry! Nos. 3117, 3351, 3351A); Nant'o and mountains to northward (Henry! No. 2689, fl.); Western Hupeh (Wilson! No. 2680, fl.). Szechwan: Mt. Omei (Wilson! No. 3143; Hugh! 1899).

Obs.—This species obviously comes near the preceding, differing however in many respects, as pointed out by the writer.* The petal is bifid in this species, while in *M. Fortunei* it is entire. The stamen also differs from that of the other species in having a truncate connective. Sprague lays great stress on the "stalked" character of the terminal leaflet. This character is however subject to variation and cannot always be relied upon. A good distinguishing character in a sterile specimen is the length of the petiole, as first noticed by Schneider.† While *M. confusa* has a very short petiole, *M. Fortunei* possesses a comparatively long one (about 5 cm.). It may also be mentioned that the leaflets of *M. confusa* are narrower and thinner than those of *M. Fortunei* and have shallower teeth on the whole.

It may be pointed out that some specimens above referred to (including those which form the type specimens of *M. confusa*) have the terminal leaflet "stalked" while others have the terminal leaflet "sessile." Moreover, those specimens with the "stalked" terminal leaflet often have broader lateral leaflets than the others. These facts might induce some botanists, especially those who consider the "stalked" or "sessile" features as very important, to attempt to separate the material into two species or at least varieties. There are however no other dividing characters. Certain specimens bearing the broader leaflets have a "sessile" terminal leaflet together with those of the more usual type (e.g. Henry, No. 3351), while another specimen collected by Henry (No. 2689) which bears narrow leaflets possesses in one of the leaves a "stalked" terminal leaflet. Further, the specimen collected by Hugh on Mt. Omei and above referred to has narrow leaflets (about half an inch broad or less, and never reaching three-quarters of an inch), yet all the terminal leaflets in this specimen are "stalked." It is evident therefore that separation of forms or species by means of "stalked" or "sessile" terminal leaflets alone is not defensible. Not only in this species, but also in many others the terminal leaflet is either "stalked" or "sessile" in the same species, and often in the same specimen, as has already been pointed out in the introduction.

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* Takeda, in Kew Bull. 1915, p. 128.

† Schneider, l.c. p. 379.

In the case of *M. confusa* it might be possible to distinguish two forms by the width of the leaflets, but how far such a distinction may be practicable in nature is a question to which the writer is not prepared to give an answer.

13. **M. Fargesii**, Takeda, sp. nov. (Plate XXVI and Plate XXXVI, figs. 173–178.)

Folia 7-juga, jugo infimo stipulis filiformibus ca. 10 mm. longis patentibus vel deflexis magnopere approximato, ejus foliolis minoribus. Foliola coriacea, marginata, oblonga vel ovato-oblonga, cuspidata, basi rotundato-truncata vel subtruncata, 3.5–5.5 cm. longa, 2.5–4 cm. lata, margine pauci- et grossi-dentata, dentibus in latere inferiore 3–5, in superiore 2, utraque pagina subnitida, nervis venisque elevatis; foliolum terminale majus, basi cuneatum. Racemi plures quam 10 fasciculati, erecti, stricti, rhachi virgata simplici. Bracteae florum ovatae vel ovato-lanceolatae, acutae, 4–6 mm. longae. Pedicelli capillares, erecto-patentes, apice subnutantes, cum bracteis aequilongi. Sepala externa oblongo-deltoidea, acuta, 2.5 mm. longa, 1.5 mm. lata, trinervia, mediana ovato-oblonga, obtusa, cymbiformia, carinata, 5 mm. longa, 2.5 mm. lata, quinquenervia, interna oblongo-elliptica, obtusa, 5.5 mm. longa, 2.5 mm. lata. Petala elliptico-oblanceolata, apice bifida, 5 mm. longa, 2 mm. lata, trinervia, basi nectariis binis distinctis ornata. Stamina cum sepalis externis aequilonga, filamento ad apicem subdilatato edentato antheris paulo longiore, connectivo lato truncato. Ovarium parvum, oblongo-ovoideum, 2.5 mm. longum, stigmate minuto, ovulis 5–7.

Hab.—Szechwan: Chenkow (Farges! in Hb. Kew, sine dato).

Obs.—The leaf bears a similar appearance to that of *M. japonica*, but the inflorescence is quite different, being straight, and having smaller denser bracts. There is also a great difference in the flowers of these two species.

14. **M. longibracteata,** Takeda, sp. nov. (Plate XXVII and Plate XXXVI, figs. 179–183.)

Folia 5-juga, jugo infimo stipulis filiformibus ut videntur brevissimis magnopere approximante, ejus foliolis quam alia dimidio minoribus. Foliola crassa, coriacea, supra flavido-viridia, nervis immersis, infra pallidiora, nervis inconspicuis, oblonga, 4–7 cm. longa, 2–3.5 cm. lata, mucronato-apiculata, basi cuneato-rotundata vel subrotundata, obliqua, margine spinoso-dentata, dentibus in latere inferiore 4–5, in superiore 3–4; foliolum terminale majus, basi longe cuneatum, apice mucronato-apiculatum, utrinque dentibus 6 spinoso-dentatum. Racemi 7–8 fasciculati, usque ad 10 cm. longi, simplices, a basi densiflori. Flores ut videntur pallide flavi. Bracteae florum lanceolatae, longe acuminatae, ca. 10 mm. longae. Pedicelli ad 5 mm. longi, erecto-patentes, ebracteolati. Sepala externa lanceolata, cymbiformia, acuminata, 4–6 mm. longa, 1.5–2 mm. lata, mediana late lanceolata vel oblongo-lanceolata, obtusa, saepe apice leviter retusa, 5–6 mm. longa, ad 3 mm. lata, interna medianis consimilia sed tenuiora, omnia trinervia, nervis lateralibus subramosis. Petala oblongo-elliptica, 4–5 mm. longa, 3 mm. lata, trinervia, apice bifida, basi nectariis binis vix distinctis ornata. Stamina filamento lato edentato antheris longiore, connectivo angustissimo truncato. Ovarium ad 3 mm. longum, 2-ovulatum stigmate sessili. Bacca ignota.

Hab.—Yunnan: "In open situations amongst scrub in side valleys on the eastern flank of the Tali Range, lat. 25° 40′ N., 8000–10,000 ft." (Forrest! No. 4345, Hb. Edinb.).

Obs.—This species is more or less closely related to *M. Veitchiorum*, from which it differs in the shape of the leaflets, the inconspicuous nectaries, and in the very narrow truncate connective.

15. **M. polyodonta,** Fedde. (Plate XXXVI, figs. 184–189.)

M. polyodonta, Fedde in Engl. Bot. Jahrb. xxxi, p. 126, fig. 3, D, 1901.

Adde notas sequentes: Racemi ad 8 fasciculati, breves, ad 5 cm. longi, simplices, densiflori, rhachi gracili. Bracteae florum lanceolatae, acuminatae, 5 mm. longae. Pedicelli bracteis breviores. Sepala externa anguste ovata, acuminata, 3–3.5 mm. longa, carinata, mediana late lanceolata, acutiuscula, 5–5.5 mm. longa, interna oblongo-elliptica, 6 mm. longa, omnia 3-nervia. Petala oblanceolata, leviter bifida, 4 mm. longa, 3-nervia, basi nectariis binis minutis ornata. Stamina petalis breviora, filamento edentato antheris subduplo longiore, connectivo angustissimo truncato. Ovarium stylo brevi praeditum, 2-ovulatum.

Hab.—Szechwan: Chenkow (Farges! No. 759).

16. **M. Sheridaniana,** Schn. (Plate XXVIII and Plate XXXVI, figs. 190–194.)

M. Sheridaniana, Schn. in Sargent, Pl. Wils. i, p. 384, 1913.

Adde notas sequentes: Racemi ad 5 fasciculati, fructiferi ad 7 cm. longi, pedicellis ad 4 mm. longis apice nutantibus. Sepala externa ovata, obtusa, 1.5 mm. longa, 5–6-nervia, mediana late ovalia, 5-nervia, 3.5 mm. longa, interna late obovata, utrinque 1-dentata (an semper ?), 5-nervia, 6 mm. longa, 4 mm. lata. Petala obovata, basi nectariis binis subrotundatis ornata, trinervia. Bacca majuscula, ovoidea, nigro-coerulea, 15 mm. longa, 10 mm. lata, estylosa, stigmate punctiformi coronata.

Hab.—Hupeh: "Changyang, woods, 8000 ft. Bush 4 ft., flower yellow" (Wilson ! No. 426).

Obs.—So far as is known the fruit of the present species is the largest in this genus.

17. **M. gracilipes,** (Oliver) Fedde. (Plate XXXVI, figs. 195–199.)

M. gracilipes, Fedde, in Engl. Bot. Jahrb. xxxi, p. 128, fig. 5, 1901.

B. gracilipes, Oliv. in Hook. Ic. Pl. ser. 3, viii, tab. 1754. 1887.

M. subtrinervis, Fedde, l.c. p. 129.

B. subtrinervis, Franch. in Bull. Mus. Hist. Nat. Paris, i. p. 63, 1895.

Hab.—Szechwan: Mt. Omei (Faber ! No. 85, fl.; Wilson ! Nos. 3144, fr., 4727, fl.).

18. **M. nitens,** Schn.

M. nitens, Schn. in Sarg. Pl. Wils. i, p. 379, 1913.

Hab.—Szechwan: "Hungya Hsien, red sandstone cliffs, alt. 1100 m." (sec. Schn. l.c.) (Wilson ! No. 2881).

Obs.—A very distinct species having leaflets markedly cuneate at the base, and with both sides symmetrical.

19. **M. decipiens,** Schn.

M. decipiens, Schn. l.c. p. 379.

Hab.—Hupeh: Changyang Hsien (Wilson ! No. 2884).

Obs.—A very well-marked species with a leaf consisting of only a few (1–2) pairs of leaflets, the lowermost of which is situated at a distance of 4.5–8 cm. from the base of petiole,* while the terminal leaflet is broadly ovate with a cordate-rotundate base. Schneider's suggestion as to its affinity with *M. napaulensis* does not commend itself to me.

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* In the original description the length is given as 2–4 cm.

20. **M. hypoleuca,** Takeda, sp. nov. (Plate XXIX.)

Folia 8–9-juga, jugo infimo stipulis filiformibus ca. 10 mm. longis maxime approximante, ejus foliolis multo minoribus, orbiculatis vel ovatis. Foliola inter se distantia, ovata, 5–6 cm. longa, 3–4 cm. lata, basi truncata vel rotundato-truncata, subobliqua, subabrupte acuminata, margine leviter spinoso-serrata, dentibus in latere inferiore 5–8, in superiore 3–5, chartacea, supra virens, subtus glauca; foliolum terminale aliis simile, ovatum, basi rotundatum. Flores et fructus desiderantur.

Hab.—Yunnan: Mengtsz, S.W. mts., 6000 ft., shrub 3 ft. (Henry! No. 9863, in Hb. Kew).

Obs.—A very distinct species, easily distinguished from other species by the foliage alone. Unfortunately neither flower nor fruit has been collected. This species is possibly related to the preceding species.

The writer greatly regrets that no specimens of the following species have been at his disposal. They are:

M. Bodinieri, Gagn. in Bull. Soc. Bot. Fr. lv, p. 85, 1908.

M. Duclouxiana, Gagn. l.c. p. 87.

M. eurybracteata, Fedde, in Engl. Bot. Jahrb. xxxi, p. 127, fig. 4, C, 1901.

M. ganpiensis, Léveillé, in Fedde, Repert. vi, p. 372, 1909.

M. Leveilleana, Schn. in Sarg. Pl. Wils. i, p. 385, 1913.

M. setosa, Gagn. l.c. p. 86.

From the descriptions most of them appear to be good distinct species. *M. eurybracteata* appears to be a form of *M. Fortunei*, but it is impossible to settle the question from the original description alone. *M. ganpiensis* does not seem to be a *Mahonia* at all, since the author says: "*folia paripinnata*" . . . "*stigmate . . . villoso.*" As far as the writer's knowledge goes, there is no *Mahonia* with a paripinnate leaf, or a villous stigma. It may, however, be possible that the terminal leaflet was missing from the type specimen, and some fluff of blotting paper might have remained on the stigma when pressed. Apart from these *bêtises*, the whole description is so vague, lacking in all the important points but characters common to the genus, that no one can picture this species at all. It would therefore be wise to disregard it altogether.

III. THE FORMOSAN SPECIES.

The first record of *Mahonia* in Formosa is that of Professor Matsumura,* and afterwards there is that of Dr. Hayata,† who mentions the occurrence of a single species, *Berberis nepalensis*, in a few places in the mountainous districts. Through the kindness of Dr. Hayata the writer has had an opportunity of examining some of the specimens referred to. Unfortunately the specimens are very imperfect, some consisting of leaves alone, others are accompanied with young flowers only.

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* Matsum. in Tôkyô Bot. Mag. xii, p. 54, 1898.

† Hayata, Fl. Mont. Form. p. 47, 1908.

It has been found, however, that there are at least three species indigenous to Formosa, and no doubt more will be discovered.

1. **M. lomariifolia,** Takeda, sp. nov. vide supra, p. 231. (Plate XXXV, figs. 152–157.)

B. nepalensis, Hayata, Fl. Mont. Formos. p. 47, 1908, pro parte.

Hab.—Arisan (G. Nakahara ! xi. 1906). Gauzan, 8012 ped. (S. Nagasawa ! 31. x. 1905, No. 567).

Obs.—The specimen from Arisan is very young and possesses small immature flowers about 3 mm. in length, while the ovary has 2–3 ovules. The figures given in our plate of this specimen appear at first glance quite different from those of typical *M. lomariifolia*, being smaller in every respect. In particular the organs situated near the centre of the flower are very immature. The other specimen is also imperfect. It possesses leaves more than 8-jugate, leaflets coriaceous, longly cuspidate-acuminate, distantly spinose-dentate, nerves and veins more or less visible on the under surface. The inflorescence is very young with flowers hardly developed.

2. **M. morrisonensis,** Takeda, sp. nov. (Plate XXXVI, figs. 200–206.)

B. nepalensis, Hayata, l.c. pro parte.

Folia magis quam 7-juga, foliolis chartaceo-coriaceis inter se plus minusve distantibus, (inferioribus quam alia multo minoribus,) medianis lanceolatis, longe acuminatis plus minusve falcatis basi rotundato-truncatis obliquis 7–10 cm. longis 2–2.5 cm. latis margine spinoso-serratis, (dentibus in latere inferiore 10–12, in superiore 5–8,) supra nitidis, nervis venisque elevatis, subtus pallidioribus, nervis venisque prominentibus. Racemi densiflori. Flores tantum juveniles visi pedicello brevi 2–3 mm. longo suffulti, bracteis lanceolatis ca. 3 mm. longis praediti. Sepala externa lanceolata, acuminata, 2.5 mm. longa, 1 mm. lata, cymbiformia, obscure trinervia, mediana late lanceolata, acuta, cymbiformia, 3.5 mm. longa, ad 1.5 mm. lata, trinervia, interna oblongo-lanceolata, acuta, 5 mm. longa, ad 2 mm. lata, 5-nervia. Petala oblanceolata apice leviter bifida, basi nectariis binis distinctis ornata, trinervia, 4 mm. longa. Stamina petalis breviora, filamento edentato antheris subduplo longiore, connectivo truncato. Ovarium oblongum, 3 mm. longum, 3-ovulatum stylo brevi coronatum. Bacca ovoidea, 6 mm. longa, 4 mm. lata, atro-coerulea, pruinosa, stylo brevi (ad 1 mm. longo), pedicello 3–4 mm. longo, bracteis 5–6 mm. longis coriaceis viridescentibus praedita.

Hab.—Mt. Morrison, 7500 ped. (T. Kawakami et U. Mori! 16. xi. 1906, fl. juv. et fr.).

Obs.—Amongst the Formosan species known at present this is distinguished by having chartaceous leaflets and truncate connective.

There is another specimen from Mt. Morrison (U. Mori! 17. x. 1906) consisting of a single leaf. The leaf is about 45 cm. in length with about 12 pairs of leaflets which are similar to those of the preceding species, but thicker in texture, hardly falcate, and provided with less numerous teeth (5–8 on the lower and 4–6 on the upper margin). It is possible that this specimen belongs to a distinct (and probably new) species, but at present it is left undescribed.

IV. THE JAPANESE SPECIES.

There is only one species known from Japan, and this has not been found wild, so far as the writer's experience goes. It may have been introduced from a neighbouring country as a cultivated plant, but the writer has seen no typical specimen of *M. japonica* collected outside Japan.

This is the oldest species of this genus, having been first described * and figured † as *Ilex japonica*, then transferred to *Berberis*,‡ and finally to *Mahonia*.§ Many years afterwards this species was confused with *M. Bealei*,|| and this mistake has often been repeated. These two species may show some resemblance in foliage under abnormal circumstances, yet an absolute distinction can always be seen in the inflorescences. While *M. Bealei* has racemes rather straight, stout, and densely beset with small bracts, those of *M. japonica* are rather slender, straggling, and loosely furnished with large ovate bracts. The flowers of these species are totally different (compare figs. 83–103 and 207–211). As *M. japonica* is not sufficiently understood, a full description of it is given below.

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* Thunb. Fl. Japon. p. 77, 1784.

† Thunb. Ic. Fl. Japon. iv, tab. 2, 1802.

‡ R. Br. in Tuckey, Congo Exped. App. p. 22, 1816.

§ DC. Syst. ii, p. 22, 1821.

|| Lindl. in Lind et Paxt. Fl. Gard. i, p. 11, 1850–51.

M. japonica, (Thunb.) DC. (Plate XXX and Plate XXXVI, figs. 207–211.)

M. japonica, DC. Syst. ii, p. 22, 1821.

Ilex japonica, Thunb. Fl. Japon. p. 77, 1784; Ic. Pl. Japon. iv, tab. 2, 1802.

B. japonica, R. Br. in Tuckey, Cong. Exped. App. p. 22, 1816.

M. japonica, pro parte et var. *gracillima*, Fedde, l.c. pp. 118, 120.

B. japonica var. *gracillima*, Rehd. in Mitteil. d. Deutsch. Dendrol. Gesellsch., 1912, p. 184.

Folia ca. 7-juga, jugo infimo a stipulis obsoletis vel deficientibus paulo distante, ejus foliolis quam alia dimidio minoribus. Foliola inter se distantia, coriacea, lanceolato-ovata vel oblongo-ovata, saepe subfalcata, basi cuneato-rotundata vel cuneata, apice cuspidato-acuminata, margine grosse spinoso-dentata, dentibus in latere inferiore 4–6, in superiore 3–5, supra nitida viridia vel atroviridia, in sicco nervis venisque conspicuis leviter elevatis, infra flavido-viridia, nervis venisque subconspicuis; foliolum terminale aliis simile, basi cuneatum. Racemi ad 10 fasciculati, 10–20 cm. longi, divergentes, simplices, laxiflori, rhachi subcrassa. Bracteae ovatae vel lanceolato-ovatae, acuminatae, virides, 5–8 mm. longae, 2–4 mm. latae. Pedicelli graciles, sub anthesin 6–7 mm. longi, tandem ad 10 mm. elongati, nutantes. Sepala externa ovato-deltoidea, obtusa, 2.5 mm. longa et lata, 7-nervia, mediana late ovalia, 3.5 mm. longa, 2.5 mm. lata, 5-nervia, interna ovalia, 7 mm. longa, 4 mm. lata, 5-nervia. Petala sepalis internis paululum breviora, 3-nervia, apice bifida, basi nectariis binis indistinctis ornata. Stamina petalis breviora, filamento lato edentato antheris duplo longiore, connectivo lato truncato. Ovarium ovoideum, 4–5-ovulatum, stylo brevissimo, stigmate 1 mm. diametro superante. Bacca ovoidea, atropurpurea, pruinosa ad 8 mm. longa, 4 mm. lata.

Hab.—Japan (ex Hb. Lugdno. Batav. steril.); Garden at Nagasaki (Oldham! No. 686), Tôkyô (Terasaki! v. 1906), etc.

Obs.—From the above description and the figures referred to, it will easily be seen that the present species differs from *M. Bealei* in many respects. Fedde's var. *gracillima* is nothing but the typical *M. japonica*, while his *M. japonica* is a mixture of *M. japonica* and *M. Bealei*.

The writer has received from Mr. G. Reuthe, Keston, Kent, specimens of *Mahonia* labelled as *M. intermedia* and *M. Bealei*. As these specimens are represented by leaves alone it is difficult to determine them with certainty, but the former appears to be the typical *M. japonica* and the latter a large form of the same species. If these specimens actually represent the so-called *M.*

intermedia and *M. Bealei* known among the florists, and if the identification be correct, we may regard these two names as synonyms of *M. japonica*.* It is strange that *M. Bealei* is known amongst florists as *M. japonica*.

V. THE SIAMESE SPECIES.

The occurrence of this genus in Siam was made known first in the year 1911 † by Craib. Specimens were identified as *M. nepalensis*, but this identification was subsequently considered doubtful by the same botanist and the record cancelled.‡ The writer is deeply indebted to Mr. Craib for kindly handing over his specimens together with newly acquired material for investigation. This species has proved to be new to science, and has been named *M. siamensis*.

M. siamensis, Takeda. (Plate XXXI and Plate XXXVI, figs. 212–217.)

M. siamensis, Takeda, in Kew Bull. 1915, p. 422.

M. nepalensis, Craib, in Kew Bull. 1911, p. 11, non DC.

Folia ad 45 cm. longa, 7–8-juga, jugo infimo stipulis subulatis ad 10 mm. longis subdeflexis valde approximante, ejus foliolis quam alia 2–3-plo minoribus. Foliola inter se plus minusve approximata, lanceolata vel ovato-lanceolata, basi cuneata vel subtruncata, obliqua, apicem versus sensim attenuata nec cuspidato-acuminata, firmissime coriacea, supra nitida, nervis immersis, subtus pallidiora, nervis venisque elevatis, 5–10 cm. longa, 2–4 cm. lata, spinoso-denticulata, dentibus in latere inferiore 5–9, in superiore 4–8 ; foliolum terminale aliis simile, basi subrotundatum. Racemi 6–10 fasciculati, densiflori, rhachi crassa basi saepe subramosa sub anthesi 5–15 cm. longa 2 mm. diametro demum elongata et incrassata, fructifera robusta ad 30 cm. longa vel ultra ad 5 mm. diametro subtereti. Bracteae florum ovatae, acutae, scariosae, 3–6 mm. longae, 2–4 mm. latae. Pedicelli 5–10 mm. longi, demum ad 7–12 mm. elongati, stricti, patentes. Sepala externa ovato-deltoidea, minuta, 2 mm. longa et lata, 5-nervia, mediana rotundato-ovata, ad 4 mm. longa, 3 mm. lata, 7-nervia, interna oblongo-elliptica, 8 mm. longa vel paulo ultra, 4.5 mm. lata, apice integra vel interdum leviter bifida, 7-nervia. Petala elliptica, apice biloba, basi nectariis binis distinctis ornata, 7.5 mm. longa, 4 mm. lata, 5-nervia. Stamina petalis breviora, filamento apice leviter incrassato edentato antheris longiore, connectivo depresso-triangulari apiculato. Ovarium globoso-ovoideum, stylo 2 mm. longo, stigmate capitato 1.5 mm. diametro, ovulis 4–6. Bacca globosa, ad 5 mm. diametro, stylo ca. 2 mm. longo coronata, atro-coerulea, pruinosa.

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* Fedde (l.c. p. 120) regards *M. intermedia* as being conspecific with *M. napaulensis*.

† Craib in Kew Bull. 1911, p. 11.

‡ Craib, Contr. to the Fl. of Siam, in Aberdeen Univ. Studies, No. 57, p. 10, 1912.

Hab.—Chiengmai, Doi Sutep: "5000–7500 ft. Shrub to 10 ft. high; berries blue; evergreen jungle" (Kerr! iv. 1910, No. 1107, fr.); ibid. "1670 m. Shrub about 4 m. high, evergreen jungle" (Kerr! 11. iv. 1914, No. 1107A).

Obs.—This plant appears to be of uncommon occurrence. It may be remotely related to *M. longibracteata*, but differs in many points. It also resembles *M. flavida*, but the flower of the Siamese species is much larger and the whole plant is not reddish-brown as in the other.

VI. THE MALACCAN SPECIES.

From this district *M. napaulensis* has been recorded,* the specimen having been collected by Griffith in Mergui. Griffith's specimen (No. 120) is, unfortunately, deflorate, so that no decided opinion can be formed thereupon. It has a similar appearance to *M. siamensis*, and may possibly be the same or a closely related species.

VII. THE BURMESE SPECIES.

From Burma also *M. napaulensis* has been recorded.† The writer has had no opportunity of examining any specimens supporting that record. The only specimen of *Mahonia* from Burma, which the writer has seen, is *M. siamensis* (v. supra), collected in the Southern Shan States: Keng Tung, about 4000 ft., by R. W. MacGregor in October 1909, No. 1236 fl. (Hb. Calcutt.).

It may perhaps be presumed that the specimen recorded by Hemsley from "Shan Hills" belonged to the same species.

VIII. THE ANNAM SPECIES.

M. annamica, Gagnep. is the only species hitherto found in Annam.‡ From the original description it seems to be quite a distinct species. The specimen however has not been seen by the writer.

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* Hook. f. and Thoms. in Hook. f. Fl. Brit. Ind. i, p. 109, 1872.

† Kurz, Forest Fl. of Burma, i, p. 58, 1877; Hemsley, in Collett and Hemsley, On Plants from Upper Burma and the Shan States, in Journ. Linn. Soc., Bot. xxviii, p. 17, 1890.

‡ Gagnepain, in Bull. Soc. Bot. Fr. lv, p. 84, 1908.

IX. THE JAVANESE SPECIES.

In the year 1859 Miquel recorded the occurrence of *Berberis napaulensis* in Java. The writer has had no opportunity of examining Miquel's specimen nor any other collected in Java. It is probably an erroneous record. Miquel's brief description of his specimen does not go beyond the generic characters.

X. THE PHILIPPINE SPECIES.

The Philippine species furnishes us with another instance of a wrong record of *M. napaulensis*. The writer has fortunately been enabled to examine several excellent specimens with both flower and fruit, and found that he was dealing with another new species, a description of which follows.

M. philippinensis, Takeda, sp. nov. (Plate XXXII and Plate XXXVI, figs. 218–222.)

M. nepalensis, Merrill, in Phil. Journ. Sci. i, Suppl., p. 190 (1906).

Folia 15–30 cm. longa, 5–10-juga, infimo jugo stipulis subulatis vel filiformibus ad 13 mm. longis magnopere approximante, ejus foliolis quam alia 2–3-plo minoribus oblongo-ovatis. Foliola inter se plus minusve distantia, papyraceo-chartacea vel chartaceo-coriacea, 3–6 cm. longa, 2–3 cm. lata, ovato-lanceolata, basi truncata vel rotundato-truncata, obliqua, apicem versus sensim acuminata, spinoso-dentata, spinis in latere inferiore 4–6, in superiore 3–4, supra nitida, venis inconspicuis, infra subnitida, nervis venisque elevatis ; foliolum terminale aliis paulo majus, basi truncatum vel rotundato-truncatum. Racemi 5–6 fasciculati, graciles, sub anthesin 10–20 cm. longi, fructiferi ad 20 cm. longi vel ultra. Bracteae florum ovato-lanceolatae, acutae vel acutiusculae, 2–3 mm. longae, 2 mm. latae. Pedicelli erecto-patentes, graciles, 8–13 mm. longi. Sepala externa ovata, obtusa, 2 mm. longa, 1–1.5 mm. lata, ad 5-nervia, mediana ovato-orbiculata, 5-nervia, 3–3.5 mm. longa, 3 mm. lata, interna elliptica, 6 mm. longa, 3 mm. lata, 5–7-nervia. Petala cum sepalis internis aequilonga, late elliptica, apice leviter bifida, basi nectariis binis distinctis ornata, 3–5-nervia. Stamina edentata, antheris filamento subduplo brevioribus, connectivo lato truncato. Ovarium ovoideum, 3 mm. longum, stylo brevissimo 0.5 mm. longo, ovulis 2. Bacca globosa, ad 8 mm. diametro, nigro-coerulea, pruinosa, stigmate punctiformi coronata.

Hab.—Benguet, Luzon (Loher ! No. 60, fl., fr. ; Elmer ! No. 5929, fr. ; Williams ! No. 1460, fl., defl.).

The present investigation clearly shows that our knowledge of the genus *Mahonia* has been and still is very imperfect. It is remarkable how numerous are the species which have erroneously been recorded as *M. napaulensis*, without their real nature being satisfactorily understood. No doubt many more new species are still to be found, while many more specimens of the known species must be collected and carefully examined before they can be adequately defined.

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EXPLANATION OF PLATES I–XXXVII.

Illustrating H. Takeda's Paper on the Old World Species of Mahonia.

PLATE I.—*M. napaulensis*, DC. ×$\frac{4}{11}$.
" II.—*M. napaulensis*, DC. ×$\frac{4}{7}$.
" III.—*M. Griffithii*, Takeda. ×$\frac{4}{11}$.
" IV.—*M. pycnophylla*, Takeda. ×$\frac{4}{11}$.
" V.—*M. Roxburghii*, Takeda. ×$\frac{1}{2}$
" VI.—*M. acanthifolia*, G. Don. ×$\frac{4}{11}$.
" VII.—*M. sikkimensis*, Takeda. ×$\frac{2}{5}$.
" VIII.—*M. borealis*, Takeda. ×$\frac{4}{11}$.
" IX.—*M. manipurensis*, Takeda. ×$\frac{4}{11}$.
" X.—*M. Simonsii*, Takeda. ×$\frac{2}{5}$.
" XI.—*M. Leschenaultii*, Takeda. ×$\frac{4}{11}$.
" XII–XIII.—*M. Bealei*, Carr. ×$\frac{4}{11}$.
" XIV.—*M. flavida*, Schn. ×$\frac{4}{11}$.
" XV.—*M. Fordii*, Schn. ×$\frac{4}{11}$.
" XVI.—*M. Mairei*, Takeda. ×$\frac{1}{2}$.
" XVII.—*M. bracteolata*, Takeda. ×$\frac{1}{2}$.
" XVIII.—*M. dolichostylis*, Takeda. ×$\frac{1}{2}$.
" XIX.—*M. conferta*, Takeda. ×$\frac{4}{11}$.

PLATE XX.—*M. Hancockiana*, Takeda. ×$\frac{4}{11}$.
,, XXI–XXII.—*M. lomariifolia*, Takeda. ×$\frac{1}{2}$.
,, XXIII.—*M. Veitchiorum*, Schn. ×$\frac{4}{11}$.
,, XXIV.—*M. Fortunei*, Fedde. ×$\frac{4}{11}$.
,, XXV.—*M. confusa*, Sprague. ×$\frac{4}{11}$.
,, XXVI.—*M. Fargesii*, Takeda. ×$\frac{2}{5}$.
,, XXVII.—*M. longibracteata*, Takeda. ×$\frac{1}{2}$.
,, XXVIII.—*M. Sheridaniana*, Schn. ×$\frac{4}{11}$.
,, XXIX.—*M. hypoleuca*, Takeda. ×$\frac{4}{11}$.
,, XXX.—*M. japonica*, DC. ×$\frac{1}{2}$.
,, XXXI.—*M. siamensis*, Takeda. ×$\frac{4}{11}$.
,, XXXII.—*M. philippinensis*, Takeda. ×$\frac{4}{11}$.

In the following Plates all the figures are magnified six times, except fig. 206, which is of natural size. In each species the outermost, middle, and innermost sepals, petal, stamen and often pistil are shown in the order mentioned. Where the middle and innermost sepals are very similar, only one of them is delineated.

PLATE XXXIII. FIGS. 1–5.—*M. napaulensis*, DC. (Buchanan, Nepal), fig. 2 = middle sepal.
,, ,, ,, 6–9.—*M. pycnophylla*, Takeda (Hooker et Thomson, Khasya).
,, ,, ,, 10–13.—The same (Griffith, Khasya).
,, ,, ,, 14–18.—*M. acanthifolia*, G. Don (Wall., type).
,, ,, ,, 19–23.—The same (Hook., Darjiling).
,, ,, ,, 24–29.—*M. a.* var. *Drummondii*, Takeda (Drummond, Darjiling).
,, ,, ,, 30–34.—*M. borealis*, Takeda (Keshava Nand, Jodi Forest).
,, ,, ,, 35–40.—The same (Lace, Chil to Dalhousie).
,, ,, ,, 41–46.—The same (Strachey and Winterbottom, Binsao).
,, ,, ,, 47–51.—*M. manipurensis*, Takeda (Watt, Manipur).
,, ,, ,, 52–57.—*M. Roxburghii*, Takeda (Buchanan, hort. Calcutta).
PLATE XXXIV. FIGS. 58–62.—*M. Leschenaultii*, Takeda (Ball, Nilgherry).
,, ,, ,, 63–67.—The same (Wight, No. 50).
,, ,, ,, 68–72.—*M. Leschenaultii*, Takeda (Gardener, 1848).
,, ,, ,, 73–77.—The same (Hohenacker, No. 1125).
,, ,, ,, 78–82.—The same (Wight, No. 49).
,, ,, ,, 83–88.—*M. Bealei*, Carr. (Henry, No. 3283).
,, ,, ,, 89–93.—The same (Henry, No. 1450).
,, ,, ,, 94–98.—The same (hort. Kew, "type" form).
,, ,, ,, 99–103.—The same (hort. Kew, var. "planifolia").
,, ,, ,, 104–109.—*M. flavida*, Schn. (Henry, No. 10,180).
,, ,, ,, 110–115.—*M. Fordii*, Schn. (ex Hb. Hongk. No. 17, addition).
PLATE XXXV. FIGS. 116–120.—*M. Mairei*, Takeda (Maire, No. 101).
,, ,, ,, 121–125.—*M. bracteolata*, Takeda (Forrest, No. 7364).
,, ,, ,, 126–130.—*M. dolichostylis*, Takeda (Maire, No. 2003).
,, ,, ,, 131–135.—*M. conferta*, Takeda (Henry, No. 10,180A).
,, ,, ,, 136–140.—*M. Hancockiana*, Takeda (Hancock, No. 151).
,, ,, ,, 141–146.—*M. lomariifolia*, Takeda (Forrest, No. 9244).
,, ,, ,, 147–151.—The same (Henry, No. 10,309, not fully developed).
,, ,, ,, 152–157.—The same (Formosan spec.; from a very young flower).
,, ,, ,, 158–162.—*M. Veitchiorum*, Schn.

PLATE XXXVI. FIGS. 163–167.—*M. Fortunei*, Fedde (Fortune).
" " " 168–172.—*M. confusa*, Sprague.
" " " 173–178.—*M. Fargesii*, Takeda (Farges, Chenkow).
" " " 179–183.—*M. longibracteata*, Takeda (Forrest, No. 4345).
" " " 184–189.—*M. polyodonta*, Fedde (Farges, No. 759).
" " " 190–194.—*M. Sheridaniana*, Schn. (Wilson, No. 426).
" " " 195–199.—*M. gracilipes*, Fedde.
" " " 200–206.—*M. morrisonensis*, Takeda (Kawakami and Mori, 16. xi, 1906; young flower).
" " " 207–211.—*M. japonica*, DC.
" " " 212–217.—*M. siamensis*, Takeda (Kerr, No. 1107A).
" " " 218–222.—*M. philippinensis*, Takeda.
PLATE XXXVII. FIGS. 1–8.—*M. sikkimensis*, Takeda.
" " " 9–15.—*M. Simonsii*, Takeda.

New Species of Primula belonging to the Petiolaris-Sonchifolia Section.

BY

W. G. CRAIB, M.A.

THE eleven species described here are :—

- P. Boothii, Craib.
- P. bracteosa, Craib.
- P. Cunninghamii, King Mss.
- P. deuteronana, Craib.
- P. gracilipes, Craib.
- P. hupehensis, Craib.
- P. irregularis, Craib.
- P. saxicola, Craib.
- P. scapigera, Craib.
- P. Scullyi, Craib.
- P. sessilis, Royle Mss.

Primula Boothii, Craib.

Rhizoma rectum, circa 1 cm. crassum, radices numerosas elongatas gerens. Folia exteriora magis minusve elliptica, petiolo angustius alato ad 6 cm. longo suffulta, mediana saepissime late spatulata vel elliptico-spatulata, exterioribus parum minora, usque ad 6 cm. longa et 4.5 cm. lata, petiolo distincte alato 4–5 cm. longo suffulta, interiora gradatim decrescentia, spatulata vel oblonga, petiolo late alato vix distincto suffulta vel subsessilia, omnia apice rotundata, membranacea vel chartaceo-membranacea, margine irregulariter plus minusve argutius denticulata, pagina utraque glabra, nervis lateralibus utrinque 5–7 pagina utraque conspicuis inferioribus satis obliquis omnibus rectis vel subrectis bene intra marginem ramosis. Scapus brevissimus vel fere 2 cm. altus, flores usque ad 25 gerens; bracteae e basi 3 mm. lata longe acuminatae, acutiusculae, 5–6 mm. longae, glandulis capitatis ciliolatae; pedicelli 1.5–5 cm. longi, primo glandulis capitatis densius puberuli, demun glabrescentes. Calyx 6–9 mm. longus, dorso glandulis capitatis puberulus, intra glaber; lobi oblongi vel oblongo-lanceolati, apice breviter acuminati, acutiusculi, interdum tridentati vel latere uno tantum dentati, 3.5–4 mm. longi, circiter 1.75 mm. lati, glandulis capitatis densius ciliolati. Corolla extra saltem

juventute glandulis capitatis puberula; tubus floris brevistyli 13 mm. longus, longistyli 9 mm. longus, intra glaber; lobi obovato-cuneati, 12 mm. longi, 10 mm. lati, apice sinuato-lobulati vel trilobulati et lobulis iterum lobulatis. Antherae 2.25 mm. longae. Ovarium 1.5 mm. altum, stylo stigmate incluso 6.5 mm. vel 12.75–14 mm. longo.

Bhutan, Chardwar, Booth (?) in Herb. Watt, 2179. Meru mountains, covering the hills and Tengepane, Booth (?). No collector is indicated for these specimens either in Herb. Watt or in Herb. Calcutta, but probably they were collected by Booth.

Primula bracteosa, Craib.

Rhizoma tenue vel saepius crassum, radices elongatas emittens. Folia sub anthesin spatulata vel obovato-spatulata, apice rotundata, basi in petiolum late alatum angustata, usque ad 8 cm. longa (petiolo incluso), 2.5 cm. lata, posteriora (ex alabastro axillari evoluta) ovata vel oblongo-ovata, apice rotundata, basi truncata vel cordata, usque ad 6.5 cm. longa et 5 cm. lata, petiolo angustius sed distincte alato suffulta, omnia chartacea, pagina superiore et etiam inferiore ad costam sparse glanduloso-puberula, nervis lateralibus utrinque 6–7 bene intra marginem furcatis pagina superiore saepissime subconspicuis inferiore prominulis, nervis transversis fere semper obscuris, margine denticulata, dentibus nervis excurrentibus breviter acuminatis. Scapus fructescens folia posteriora subaequans vel ea duplo superans; bracteae exteriores normales virides, e basi satis lata fere semper longe acuminatae, acutae vel subobtusae, 3–10 mm. longae, glanduloso-puberulae et ciliatae, interiores omnes vel saltem nonnullae in folia late ovata vel suborbicularia ad 2.5 cm. diametro petiolo ad 4.5 cm. longo suffulta expansae; pedicelli usque ad 4.5 cm. longi, glanduloso-puberuli. Calyx extra glanduloso-puberulus, 6.5–7 mm. longus, lobis ovatis vel oblongo-ovatis breviter acuminatis interdum apicem versus denticulatis vel sublobatis 3.5–4 mm. longis basi circa 2.5 mm. latis glanduloso-ciliatis. Stylus stigmate incluso in flore longistylo 9 mm. longus. Capsula depresso-globosa, in calycis tubo inclusa.

Bhutan, Tongsa, Yato-la, in moss by tree bases in shady forest, 10,000 ft., Cooper, 3981; Timpu, Duké-la, sandy soil in shade of light wet forest, 9000 ft., Cooper, 3917; ascent to Woolooka, 8000–9500 ft., Griffith, K. D., 3514, pro parte; Griffith, K. D., 2314.

Primula Cunninghamii, King Mss.

Herba nana. Folia spatulata, oblongo-spatulata vel oblongo-obovata, apice rotundata, basi in petiolum alatum vix distinctum attenuata, usque ad 11 cm. longa et 2.8 cm. vel etiam 4 cm. lata sed saepissime multo breviora et angustiora, submembranacea vel chartaceo-membranacea, nervis lateralibus utrinque 8–12 rectis vel subrectis bene intra marginem ramosis, nervis eorumque ramulis in dentes excurrentibus, margine argute eroso-denticulata, matura pagina utraque glabra, efarinosa, margine minute glanduloso-ciliata. Scapus haud evolutus; flores numerosi, pedicellis corollae subaequilongis vel ea brevioribus puberulis primo parce farinosis mox efarinosis suffulti; bracteae lanceolatae vel lineari-lanceolatae, circa 3 mm. longae. Calyx 5.5 mm. longus, utrinque puberulus, primo extra farinosus, lobis 4.5 mm. longis oblanceolatis acuminatis acutis ciliolatis. Corollae tubus 7.5–10 mm. longus, extra parce puberulus, haud annulatus; limbus 15.5–16.5 mm. diametro, lobis obcordatis 6 mm. longis 5.5 mm. latis, lobulis apice rotundatis. Antherae 1.25–1.5 mm. longae, in flore longistylo in calyce omnino inclusae, in flore brevistylo circa 5 mm. a tubi basi insertae. Ovarium depresso-globosum, 1 mm. altum, stylo stigmate magno globoso incluso in flore brevistylo vix 1 mm. longo et in flore longistylo 4 mm. longo.

E. Sikkim. Jaffrey's collector (type of King's species); Cunningham ann. 1874 et 1889; Cave, 7287; Gammie, 36; Sheraothang, 13,000 ft., Cooper, 969; Chumbi Thang, Ribu, 9; Changu, Cave; below Changu, 11,500 ft., Ribu et Rhomoo, 4601; Lingtoo and Gnatung, 11,000–13,000 ft., Pantling.

S. Tibet. Younghusband, 21; Gyantse to Phari, Walton.

According to the dates on the labels this species flowers from the end of September to November. One collection in flower was made also in January (Cave). In only one case (Cooper) is the colour of the flower—purple—and the habitat—gravel and turf—noted.

Primula deuteronana, Craib.

Folia oblongo-obovata vel oblongo-ovata, apice rotundata basi in petiolum alatum distinctum vel vix distinctum angustata, ad 2.7 cm. longa et 1.7 cm. lata, coriacea, sicco subviridia, glabra, juventute farinosa, mox efarinosa, costa satis crassa supra conspicua subtus prominente, nervis lateralibus utrinque 8–9 pagina superiore conspicuis vel subconspicuis inferiore prominentibus intra marginem furcatis, nervulis subtus interdum elevatis interdum subobscuris, margine argute denticulata, interdum sublobata. Scapus haud evolutus; pedicelli ad 2 cm. longi; bracteae lineari-subulatae, circiter 5 mm. longae. Calyx 7.5 mm. longus, extra sparse glanduloso-puberulus, lobis oblongo-lanceolatis subacuminatis acutiusculis 4.5 mm. longis 1.5 mm. latis glandulis capitatis vel clavatis breviter ciliatis. Corolla purpurea, luteo-oculata; tubus (fl. brevistyli) 15 mm. longus, extra parce puberulus, intra infra stamina minute puberulus, superne dense pilosus; lobi oblongo-obovati, apice saepius trilobati, 7 mm. longi, 4 mm. lati. Antherae breviter acuminatae, 1.75 mm. longae, filamentis paulo ultra 0.5 mm. longis suffultae. Ovarium subglobosum, circiter 1 mm. altum, placenta globosa breviter sed distincte stipitata; stylus 2.5 mm. longus stigmate 0.6 mm. alto 0.5 mm. diametro.

Sikkim. Below Jongri, Pey-kiong-la, King's collector (fl. June 1887); Nye-gu-la, 13,000 ft., King's collector (fl. July 1888); Singaleelah, Sirkia-la, 14,000 ft., Watt, 5425. Sikkim, J. D. Hooker.

Primula gracilipes, Craib.

Rhizoma rectum, 2–8 mm. diametro, radices numerosas elongatas emittens. Folia saepissime oblongo-spatulata, apice rotundata obtusave, basi in petiolum plus minusve alatum angustata, rarissime subtruncata, 2–4.5 cm. longa, 1–2 cm. lata, membranacea vel chartaceo-membranacea, mox efarinosa nervis lateralibus utrinque 6–8 intra marginem ramosis pagina superiore conspicuis vel subconspicuis inferiore cum costa satis lata prominentibus, nervulis plerumque obscuris vel subobscuris, margine argute eroso-denticulata, exteriora petiolo plus minusve alato 2–3 cm. longo suffulta, interiora petiolo late alato vix distincto suffulta vel fere sessilia. Scapus haud evolutus; flores pedicellis gracilibus folia subaequantibus vel iis paulo brevioribus suffulti; bracteae quoad formam variabiles, anguste deltoideae vel lineari-lanceolatae sed saepissime apice longius attenuatae, circiter 5 mm. longae. Calyx viridis, sub anthesin extra farinosus, 6.5–7 mm. longus; lobi oblongi, breviter vel longiuscule acuminati, acuti, 3–4 mm. longi, 1.25–2 mm. lati, glanduloso-ciliolati. Corollae tubus (floris brevistyli) 13 mm. longus; lobi late obovati vel late obovato-cuneati, apice acute tridentati, 9 mm. longi, 8.5 mm. lati. Antherae 2 mm. longae, filamentis 0.5 mm. longis. Ovarium 1.75 mm. altum, stylo stigmate grandi capitato incluso 6 mm. longo.

E. Sikkim. Yeumthang, 11,000 ft., Cave; Begger, 12,500 ft., Cave; Changu, 12,000 ft., Smith, 3287; Dickchoo, 11,000 ft., C. B. Clarke, 27797B.

Primula hupehensis, Craib.

Folia late oblanceolata vel obovato-oblanceolata, apice rotundata, basi in petiolum latius alatum attenuata, usque ad 5.5 cm. longa (petiolo 5–12 mm. longo incluso) et 2.5 cm. lata, membranacea vel chartaceo-membranacea, pagina utraque parce minutissime glanduloso-puberula vel subglabra, nervis lateralibus utrinsecus circa 6 rectis erecto-patentibus intra marginem furcatis pagina utraque conspicuis vel subconspicuis, margine argutius eroso-denticulata. Scapus 3–4 cm. longus, flores 4–8 gerens; bracteae lineari-lanceolatae, 4–4.5 mm. longae, glanduloso-puberulae; pedicelli 1.8–2.5 cm. longi, glanduloso-puberuli. Calyx extra densiuscule glanduloso-puberulus, intra glaber, 7.5–8 mm. longus, lobis 3–3.75 mm. longis 1.5–1.75 mm. latis glanduloso-ciliolatis. Floris brevistyli corollae tubus 11–12 mm. longus, lobi anguste obcordati, apice usque ad 2–2.5 mm. emarginati, 8.5 mm. longi, 5.5 mm. lati; tubus apice distincte annulatus. Antherae 2.75 mm. longae, annulum paululo superantes, filamentis brevibus suffultae. Ovarium globosum, 1.5 mm. diametro, stylo cum stigmate capitato calyce paulo breviore.

Hupeh, Fang, Henry.

Primula irregularis, Craib.

Rhizoma rectum, simplex, crassum, radices satis longas emittens. Folia viva probabiliter patula vel subpatula, exteriora subelliptica, oblongo-elliptica vel elliptico-obovata, rarius ovata vel ovato-lanceolata, 4–9.5 cm. longa, 2.5–5.5 cm. lata, basi interdum subtruncata, saepius late cuneata, cuneata vel in petiolum angustata, petiolo alato usque ad 6 cm. longo suffulta, mediana spatulata, minora, petiolo multo breviore suffulta, interiora spatulato-oblonga vel oblonga, sessilia vel subsessilia, circa 2.5 cm. longa et 1.5 cm. lata, omnia apice rotundata, chartacea vel membranaceo-chartacea, pagina utraque parce glanduloso-puberula, mox subglabra, nervis lateralibus utrinque 6–7 supra conspicuis subtus prominulis rectis vel fere rectis intra marginem ramosis, nervulis pagina utraque conspicuis vel subconspicuis rarius fere obscuris, margine argute eroso-denticulata, rarius lobulata, lobulis denticulatis. Inflorescentia saltem juventute dense pallide luteo- vel sulphureo-farinosa; flores expansi folia interiora subaequantes vel iis paulo breviores, pedicellis dense glanduloso-puberulis suffulti; bracteae deltoideae, acuminatae, acutae, usque ad 11 mm. longae, indumento ut pedicelli instructae. Calyx 11.5 mm. longus, extra ut pedicelli glandulis capitatis vel clavatis dense tectus, intra parcius puberulus; lobi late oblongi, apice irregulares, rotundati, acuminati et obtusiusculi vel saepissime 3-lobulati, circa 4 mm. longi et 3 mm. lati, densius glanduloso-ciliolati. Corolla extra glanduloso-puberula; tubus 14 mm. longus, lobis late oblongo-obovatis apice sinuato-lobulatis 8 mm. longis 6.5 mm. latis. Antherae 2.5 mm. longae, filamentis brevibus suffultae.

Ovarium globosum, 1.75 mm. altum, stylo 4.75 mm. (floris brevistyli) longo, stigmate 1 mm. longo.

W. Sikkim. Chowbhangin, Cave; Singaleelah, J. D. Hooker, 11,000 ft., Elwes in Herb. Clarke, 27,481.

Primula saxicola, Craib.

Folia exteriora ovata, basi cordata vel truncata, usque ad 7.5 cm. longa et 6 cm. lata, petiolo basi vaginante 5–8 cm. longo suffulta, interiora spatulata vel elliptico-spatulata, basi cuneata vel attenuato-cuneata, 3–5 cm. longa, 1.5–3 cm. lata, petiolo plus minusve alato 3–4 cm. longo suffulta, omnia membranacea, sicca viridia, pagina utraque glabra, nervis lateralibus utrinque 6–7 plerumque rectis vel fere rectis et satis patulis intra marginem ramosis pagina utraque conspicuis, margine lobulata lobulis saepissime acute dentatis. Scapus haud evolutus; pedicelli petiolos longiores subaequantes vel saepius iis fere dimidio breviores, tenuiter glanduloso-puberuli; bracteae angustae, apice longe attenuatae, 5–6 mm. longae, margine glanduloso-ciliolatae. Calyx 8 mm. longus, utrinque sed intra parcissime glanduloso-puberulus, lobis ovato-oblongis vel oblongis acuminatis acutis subacutis 4.75 mm. longis 3 mm. latis 3-nerviis parce glanduloso-ciliolatis. Corollae tubus 14 mm. longus, lobi obovati vel oblongo-cuneati, trilobati, 7 mm. longi 5 mm. lati. Antherae vix 2.5 mm. longae, a corollae tubi basi 5.25 mm. insertae. Stylus floris longistyli stigmate incluso fere 9 mm. longus. Fructus depresso-globosus, e calycis tubo parum exsertus, calycis lobis persistentibus plus minusve deltoideis erectis vel suberectis.

N.W. Himalaya. Kulu, 5000 ft., Drummond, 8925; Cháchpur Valley, Duthie, 21,067.

Primula scapigera, Craib.

Rhizoma breve, satis crassum, radices elongatas emittens. Folia exteriora oblongo-spatulata vel oblonga, sessilia vel petiolo brevi late alato suffulta, plerumque 4–9 cm. longa et 1.5–3 cm. lata, interiora ovata, oblongo-elliptica vel elliptica, basi late cuneata, truncata vel cordata, usque ad 10 cm. longa et 6 cm. lata sed saepissime circiter 4.5 cm. longa et 3.5 cm. lata, petiolo angustius alato 5.5–8 cm. longo suffulta, omnia apice rotundata, chartacea vel membranaceo-chartacea, nervis lateralibus utrinque 6–8 intra marginem ramosis rectis patulis vel subpatulis pagina superiore conspicuis vel subconspicuis inferiore prominulis vel fere prominentibus, margine subcrasse irregulariter dentata, dentibus nervulis excurrentibus acuminatis. Scapus nunc brevissimus et in foliorum rosula immersus, nunc folia aequans et infructescens folia interdum longe superans, interdum pauciflorus, interdum multiflorus; bracteae 0.5–1 cm. longae, e basi lata plus minusve longe attenuato-acuminatae, saepissime paucidenticulatae. Calyx 1 cm. longus, lobis deltoideis vel anguste deltoideis longe attenuato-acuminatis 5.5 mm. longis 2.5 mm. latis interdum apicem versus denticulatis glanduloso-ciliolatis. Corollae tubus (floris brevistyli) 16 mm. longus, lobi 9 mm. longi et 8 mm. lati, apice nunc altius bi- vel tri-lobulati, lobulis irregulariter dentatis vel sinuatis, nunc regulariter vel plus minusve irregulariter dentati vel sinuato-dentati. Antherae 2 mm. longae, filamentis 1 mm. longis suffultae. Ovarium 1.5 mm. altum stylo stigmate grandi ambitu plus minusve oblongo incluso 4.75 mm. longo. Capsula depresso-globosa, calyce inclusa, calycis lobis persistentibus coriaceis divergentibus.—*P. petiolaris*, Wall., var. *scapigera*, Hook. f., Fl. Brit. Ind., iii, p. 494, plantis foliaceo-bracteatis exclusis.

W. Sikkim. Common all over Tonglu, 7000–10,000 ft., Watt, 7013, 5331.

Primula Scullyi, Craib.

Herba nana, escaposa, efarinosa; rhizoma robustum, radices numerosas satis longas parce ramosas emittens. Folia exteriora squamiformia, cito decidua, mediana anguste ovata, oblonga vel oblongo-obovata, usque ad 4.5 cm. longa et 2.5 cm. lata, petiolo alato usque ad 3 cm. longo suffulta, interiora sessilia vel petiolo brevi vix distincto suffulta, medianis parum minora, omnia chartacea, glabra, nervis lateralibus utrinque 6–7 rectis vel fere rectis intra marginem ramosis supra conspicuis subtus prominentibus, margine argute eroso-denticulata. Flores numerosi, folia subaequantes vel iis paulo breviores, pedicellis gracilibus usque ad 3 cm. longis primo glandulis brevibus densius instructis mox puberulis suffulti; bracteae parvae. Calyx extra sparse glanduloso-puberulus, 4.5 mm. longus; lobi lanceolati, acuminati vel subacuminati, subacuti, 2.5–2.75 mm. longi, uninervati, nervo dorso prominente, margine breviter glanduloso-ciliati. Corollae tubus 10–14 mm. longus; lobi obovato-elliptici vel obovato-oblongi, 5–6 mm. longi, 3.5–5.5 mm. lati, apice rotundati, saepissime trilobulati, lobulis acutiusculis vel obtusis, interdum irregulariter sinuato-lobulati. Antherae 1.6 mm. longae, filamentis brevibus suffultae. Ovarium 1 mm. altum, globosum, stylo (stigmate incluso) 3.5 vel 8.5 mm. longo. Fructus pedicellis magis minusve reflexis gesti, globosi, circa 3 mm. diametro, calyce persistente vix accrescente.

Nepaul. Scully.

W. Sikkim. Near Tonglu, 9000 ft., Lace, 2265; Singaleelah, 12,000–13,000 ft., Watt, 5263, 5369, Cave.

var. **Searightii,** Craib, a typo calyce extra glabro vel subglabro ejusque lobis longioribus et angustioribus.

Chumbi, 8000–9000 ft., Searight, 44; Pey-goong-la, King's collector, 433.

Primula sessilis, Royle Mss.

Rhizoma fere semper rectum, satis robustum, radices longas parcius ramosas emittens. Folia exteriora squamiformia cito decidua, mediana mox decidua, oblongo-elliptica ad obovato-oblanceolata, rarius oblanceolata, usque ad 8 cm. longa et 3 cm. lata sed saepissime minora, petiolo late alato vel vix alato usque ad 6 cm. longo interdum inferne parce puberulo suffulta, interiora oblanceolata, oblongo-oblanceolata vel obovato-oblanceolata, apice rotundata vel acuta, basi in petiolum vix distinctum alatum attenuata, saepissime circiter 2.5–4 cm. longa et 1–2 cm. lata, cum medianis chartaceo-membranacea vel chartacea, nervis lateralibus utrinque 6–7 rectis vel subrectis saepe fere patulis bene intra marginem ramosis supra cum costa conspicuis subtus prominentibus, pagina utraque glabra, margine argutius eroso-denticulata. Flores numerosi, folia saepius subaequantes vel ea paulo superantes, pedicellis gracilibus vel subgracilibus saepissime 4–6 cm. longis glabris vel praesertim superne parce glanduloso-puberulis suffulti; bracteae e basi lanceolata vel deltoidea longe subulato-acuminatae, 4–6 mm. longae. Calyx 7 mm. longus, extra parce glanduloso-puberulus vel fere glaber, lobis lineari-lanceolatis apice subaristato-acuminatis acutis acumine saepe reflexo 3–3.5 mm. longis uninervatis dorso cum tubo subcarinatis vel distincte carinatis margine pauperius glanduloso-ciliatis. Corollae tubus 12.5–15 mm. longus; lobi obovati vel oblongo-obovati, saepissime caudato-acuminati, 10 mm. longi, 7.5 mm. lati, margine apicem versus interdum sinuato-dentati. Antherae 2 mm. longae, filamentis brevibus suffultae. Ovarium globosum, 1.25 mm. altum, stylo stigmate incluso 4.75 vel 9.5 mm. longo.

N.W. India. Royle, Cleghorn. Kumaon, T. Anderson; Champwa, 12,000 ft., Strachey and Winterbottom, 247; Pass above Namik, Strachey and Winterbottom; Madharee Pass, 9000 ft., Strachey and Winterbottom, 659 (Primula No. 11). Pindri, 11,000 ft., Collett, 123. Garhwal, 11,000–12,000 ft., Duthie, 14,520. Kidarkanta, 10,000–12,000 ft., Duthie, 1184 et sine num., Gamble, 24,314, 24,360. Jaunsar, Harké Dún, 11,000 ft., Rogers. Simla, Govan; Hattoo, 10,000 ft., Gamble, 6177C. Kulu, Drummond, 8926. Bashahr, Bági Forest, 8000 ft., Lace, 78. Chamba, Watt, 4273.

Primulas of the Petiolaris-Sonchifolia Section.

BY

W. G. CRAIB, M.A.

AT the Primula conference * in 1913 I expressed the opinion that our knowledge of the species allied to *P. petiolaris* was far from satisfactory, and that for a clearer elucidation of the status of the so-called varieties it would be necessary to study the growing plants. Recently, however, an opportunity for further research has been afforded by the bringing together of all the necessary specimens from the herbaria of the Royal Botanic Garden, Calcutta, the Royal Gardens, Kew, and the Royal Botanic Garden, Edinburgh. The examination of this abundant material has served to confirm many of the opinions formed previously which, however, could not be put forward at the Primula conference owing to the inadequate material then at my disposal. The new species which have had to be described quite eclipsed previously formed expectations, and it is largely on account of this great multiplication of species that it was deemed advisable to bring together in definite form the conclusions arrived at.

HISTORICAL.

The first two species to be published were *P. petiolaris* and *P. nana*, both described by Wallich in 1824 from his Nepaul collections.† In 1882 the dwarf alpine Sikkim *P. Hookeri* was described and figured by Watt. In the end of the same year that part of the Flora of British India dealing with the Primulaceae was published. How the present-day views of species correspond with those of Hooker is well illustrated by noting that the seven varieties of *P. petiolaris* enumerated in the Flora of British India are in the present paper regarded as constituting sixteen distinct species. In 1885 the first Chinese species—*P. sonchifolia*—was described by Franchet from Delavay's Yunnan collection, and in the following year Franchet described *P. moupinensis* from David's Moupine collection.

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* Journ. Roy. Hort. Soc., vol. xxxix, p. 187 (1913).

† References to the original publication for species mentioned will be found in the chronologically arranged list.

[Notes, R.B.G., Edin., Nos. XXIX–XXX, Jan. 1917.]

In 1904 [*] we have the first natural classification of all the known Indian Primulas put forward. Sir George Watt remarks in the course of his paper that he did not advance his classification as final, and that he regarded the establishing of new sections as probably essential. With regard to the section at present under discussion I quite concur in the necessity of limiting the scope of Watt's sections. Of the seventeen species enumerated by Watt as belonging to his section Petiolaris, only three are retained in that section in the present paper. The discrepancy between this small number retained in the section and the much larger number enumerated now from the same area is explained by the fact that Watt's three species are regarded as really composed of sixteen species, which simply means that the present writer cannot agree with Watt that this section is a very "sportive assemblage" of species. The remaining fourteen species included by Watt must be distributed amongst various other sections. Taking some of those which are well known in cultivation, one cannot say that *P. Forbesii* or *P. mollis* should be included in the same section as *P. Winteri*. It is matter for great regret that Sir George Watt, with his wide knowledge of the Indian Primulas in the field, did not see his way clear to multiply his sections instead of confining himself to an expression of belief that such a course might eventually be necessary.

In the following year (1905) there was published in Engler's Pflanzenreich Pax's monograph of Primula. The general classification of the genus follows very closely that proposed by the same author seventeen years previously.[†] His treatment of the section Petiolares as to the species included in it corresponds much more closely to that adopted in the present contribution than to that proposed by Watt which has been referred to above. In his later monograph Pax includes in his section Petiolares an Indian and a Chinese species which have since been excluded, viz. *P. Tanneri* and *P. pellucida*. The former, along with *P. Roylei*, *P. Griffithii*, *P. Gammieana*, etc., forms a very natural group, approaching in fruit character *P. sonchifolia*, *P. Whitei*, and *P. scapigera*, but in habit recalling more the *P. Moorcroftiana* alliance. *P. pellucida*,[‡] on the other hand, belongs to the Malacoides section, and is closely allied to *P. Forbesii*. With these two exceptions the writer accepts the section Petiolares of Pax, but as the title of this paper shows he has linked with it the Sonchifolia section, which includes three species—*P. sonchifolia*, *P. taraxacoides*, and *P. Whitei*. Arguments, with a certain amount of justification, might be adduced against linking the *sonchifolia* with the *petiolaris* type, but certainly no arguments would convince me that Pax was justified in placing *P. sonchifolia* in the same section as *P. japonica*, *P. Cockburniana*, *P. Poissonii*, etc. In favour of the petiolaris-sonchifolia link now adopted, one has the fact that the development form of *P. sonchifolia* as also the fruit is that of *P. Hookeri* and *P. vernicosa*, and to a slightly less degree of *P. Winteri* and *P. Edgeworthii*.

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[*] Watt in Journ. Roy. Hort. Soc., vol. xxix, pp. 295–326.

[†] Pax in Engler Bot. Jahrb., vol. x, p. 75 (1888).

[‡] Balf. f. in Journ. Roy. Hort. Soc., vol. xxxix, p. 150 (1913).

Reference to fruit character in this section would be incomplete without an admission that of many, or rather of the majority, the mature fruit is unknown. In *P. vernicosa* the capsule cracks irregularly round the top and crumbles away. This would appear to be the method of dehiscence also of *P. sonchifolia*, *P. scapigera*, *P. Whitei*, and probably of *P. bracteosa*. From the immature material of several of the other species, however, the writer concludes that there is evidence, but not wholly convincing evidence, of the presence of longitudinally dehiscing capsules.

As a preliminary to the examination of Pax's treatment of the individual species it should be noted that of the seven species enumerated, Pax indicates that he saw specimens of only three, and that of the six varieties of *P. petiolaris* he saw specimens of only three. In his treatment of *P. petiolaris* Pax follows the Flora of British India, with the single exception that he rightly raises the variety *Edgeworthii* to specific rank. The fact that so few specimens were seen by Pax may account for such unequal treatment of two closely allied plants, viz. var. *pulverulenta*, Hook. f. and var. *Edgeworthii*, Hook. f. The former Pax retains as a variety of *P. petiolaris* and the latter he raises to a species.

Pax also raises to specific rank *P. petiolaris* var. *odontocalyx*, Franchet, but again evidently without having seen any authentic specimens.

Three years later G. Forrest added another species from his Yunnan collections, viz. *P. taliensis*. In the same paper Forrest describes and illustrates another new species—*P. gratissima*—which was, however, recognised later to be Franchet's *P. sonchifolia*. Anyone working from Pax's monograph would be justified in redescribing Franchet's species when one considers with what species Pax placed the plant.

The introduction of *P. petiolaris* var. *pulverulenta*, Hook. f. to cultivation led W. Watson to recognise the plant as a distinct species under the name *P. Winteri*. Whether this plant is really distinct from the true *P. nana* of Nepaul or not will only be solved by the receipt of additional material from Nepaul.

In *P. Whitei* W. W. Smith described the Bhutan representative of the Yunnan and Upper Burma *P. sonchifolia*.

At the Primula conference it was deemed prudent to raise to specific rank only two more of the varieties of *P. petiolaris*, viz. var. *sulphurea* and var. *Stracheyi*, both from Kumaon. Up to the end of 1913 we find that four of Hooker's seven varieties of *P. petiolaris* had been raised to specific rank. The varieties still remaining at this time and up to the present year are var. 1 *petiolaris proper*, var. 2 *nana*, and var. 7 *scapigera*. In var. 1 Hooker included probably only one species, viz. the true *P. petiolaris* from Nepaul. In var. 2 he included, according to the writer's views, six or seven species, and in var 7, two species.

Last year Professor Balfour described from Yunnan *P. taraxacoides*, a plant closely allied to *P. sonchifolia*.

In course of publication there is also *P. vernicosa* from Yunnan and Upper Burma, which may be regarded as the Eastern representative of the Sikkim *P. Hookeri*.

The material consulted in the elaboration of the present paper consisted of the specimens preserved in the herbaria of the Royal Botanic Gardens at Calcutta and Edinburgh, and the Royal Gardens, Kew, and to the responsible heads of these departments I beg to record sincere thanks for kindly placing the specimens at my disposal. To Professor I. B. Balfour, F.R.S., I am also much indebted for useful constructive criticism during the progress of the work. M. F. Gagnepain of the Paris herbarium has also kindly supplied very useful critical notes on several of Franchet's species, the types of which were not examined by me. To Mr. S. A. Skan, Royal Gardens, Kew, I am also indebted for references to and quotations from literature not otherwise available.

LIST OF SPECIES CHRONOLOGICALLY ARRANGED.

With type locality, and within brackets any further recorded distribution of the species.

P. petiolaris, Wall. in Roxb. Fl. Ind., vol. ii, p. 22 (1824). Nepaul.

P. nana, Wall. in Roxb. Fl. Ind., vol. ii, p. 23 (1824). Nepaul.

P. Hookeri, Watt in Journ. Linn. Soc., vol. xx, p. 14, t. 8B. (1882). Sikkim.

P. sonchifolia, Franchet in Bull. Soc. Bot. Fr., vol. xxxii, p. 266 (1885). Yunnan [Upper Burma].

P. moupinensis, Franchet in Bull. Soc. Bot. Fr., vol. xxxiii, p. 67 (1886). Moupin.

P. Edgeworthii, Pax in Engler Pflanzenr. Primulac., p. 41 (1905). N.W. Himalaya.

P. odontocalyx, Pax in Engler Pflanzenr. Primulac., p. 41 (1905). Szechuan.

P. taliensis, G. Forrest in Notes Roy. Bot. Gard. Edin., vol. v, p. 220, t. xxxii (1908). Yunnan.

P. Winteri, W. Watson in Gard. Chron., vol. xlix, p. 130. fig. 63 (1911). Kumaon.

P. Whitei, W. W. Smith in Rec. Bot. Surv. Ind., vol. iv. p. 268 (1911). Bhutan.

P. Drummondiana, Craib in Journ. Roy. Hort. Soc., vol. xxxix, pp. 186 et 190 (1913). Kumaon.

P. sulphurea, Craib in Journ. Roy. Hort. Soc., vol. xxxix, pp. 186 et 190 (1913). Kumaon.

P. taraxacoides, Balf. f. in Notes Roy. Bot. Gard. Edin., vol. ix, p. 49 (1915). Yunnan.

P. vernicosa, F. K. Ward in Notes Roy. Bot. Gard. Edin., vol. ix, p. 203 (1916). Yunnan; Upper Burma.

P. Boothii, Craib in Notes Roy. Bot. Gard. Edin., vol. vi, p. 249 (1917). Bhutan.

P. bracteosa, Craib in Notes Roy. Bot. Gard. Edin., vol. vi, p. 250 (1917). Bhutan; W. Sikkim.

P. Cunninghamii, King ex Craib in Notes Roy. Bot. Gard. Edin., vol. vi, p. 250 (1917). E. Sikkim; Tibet.

P. deuteronana, Craib in Notes Roy. Bot. Gard. Edin., vol. vi, p. 251 (1917). Sikkim.

P. gracilipes, Craib in Notes Roy. Bot. Gard. Edin., vol. vi, p. 252 (1917). E. Sikkim.

P. hupehensis, Craib in Notes Roy. Bot. Gard. Edin., vol. vi, p. 252 (1917). Hupeh.

P. irregularis, Craib in Notes Roy. Bot. Gard. Edin., vol. vi, p. 253 (1917). W. Sikkim.

P. saxicola, Craib in Notes Roy. Bot. Gard. Edin., vol. vi, p. 254 (1917). N.W. Himalaya.

P. scapigera, Craib in Notes Roy. Bot. Gard. Edin., vol. vi, p. 254 (1917). W. Sikkim.

P. Scullyi, Craib in Notes Roy. Bot. Gard. Edin., vol. vi, p. 255 (1917). Nepaul; W. Sikkim.

P. sessilis, Royle ex Craib in Notes Roy. Bot. Gard. Edin., vol. vi, p. 256 (1917). N.W. Himalaya.

ALPHABETICAL LIST OF THE SPECIES.

P. Boothii, Craib
P. bracteosa, Craib
P. Cunninghamii, King ex Craib
P. deuteronana, Craib
P. Drummondiana, Craib
P. Edgeworthii, Pax
P. gracilipes, Craib
P. Hookeri, Watt
P. hupehensis, Craib
P. irregularis, Craib
P. moupinensis, Franchet
P. nana, Wall.
P. odontocalyx, Pax

P. petiolaris, Wall.
P. saxicola, Craib
P. scapigera, Craib
P. Scullyi, Craib
P. sessilis, Royle ex Craib
P. sonchifolia, Franchet
P. sulphurea, Craib
P. taliensis, G. Forrest
P. taraxacoides, Balf. f.
P. vernicosa, F. K. Ward
P. Whitei, W. W. Smith
P. Winteri, W. Watson.

GROUPING OF THE SPECIES.

Among the species enumerated there can be recognised seven quite natural groups as follows :—

1. Including *P. Hookeri* from Sikkim and *P. vernicosa* from Yunnan and Upper Burma, dwarf alpines with very compact foliage, coriaceous imbricate bud scales persistent at flowering time and closely investing the foliage, of which the outer members are very much broadened and sheathing at their bases. The small white flowers are borne on minute, nearly always 2-flowered scapes, but appear as if quite sessile, immersed in the compact foliage or just overtopping the leaves ; flowers and leaves coetaneous or nearly so. By this one character of the immersed, apparently sessile flowers, these two species can be immediately distinguished from all the other species of the section. *P. taliensis* is occasionally very small, with the flowers scarcely as long as the leaves, but a distinct pedicel and a more or less distinct scape is always found. Plants of *P. vernicosa* fruiting here last year, one in the open, the other under glass, had the scape fully 2.5 inches long. For some time after the fruit had set there was very little sign of elongation of the scape, which, however, lengthened very rapidly as the fruit approached maturity.

2. Represented by one species—*P. taliensis* from Yunnan. Small, stalked capitate or club-shaped glands are to be found in practically every member of the section, yet in only two species, viz. *P. taliensis* and *P. Drummondiana*, are there distinct gland-tipped hairs. In the latter these hairs are confined to the upper surface of the leaf, and are there found only towards the margin, whereas in *P. taliensis* they occur practically all over the plant, and are very dense on the scape and pedicels. *P. taliensis* is a small plant, with usually spathulate or obovate, more or less distinctly petioled, toothed leaves. The flowers are borne on 2–7-flowered short scapes, and are subequal to the leaves or more often just overtop the leaves. The corolla lobes are toothed or sometimes almost fringed, and the tube is exannulate. The calyx lobes, which are shorter than the tube, are sometimes acutely acuminate, sometimes more or less distinctly toothed on one side, and very often 3-toothed at the

apex. In this toothing of the calyx lobes *P. taliensis* resembles very much *P. odontocalyx*. The capsule, judging by the immature fruiting specimens, is included in the calyx tube.

3. Including *P. sonchifolia* from Yunnan and Upper Burma, *P. taraxacoides* from Yunnan, and *P. Whitei* from Bhutan. Here we find the same type of development as in the first group, but the plants themselves are much larger and more robust. At flowering time there are many stiff large bud scales persistent. Flowers and leaves develop practically simultaneously. In *P. sonchifolia* and *P. taraxacoides* the scape is quite evident at flowering time, but in *P. Whitei*—at least as far as the flowering material to hand shows—the scape is not visible, being much shorter than the leaves. In fruit, however, the scape elongates rapidly, and is ultimately subequal to or longer than the leaves. The scape is nearly always many-flowered, the bracts at the base of the pedicels being elongate and narrow in *P. Whitei*, but short and rather broad at the base in the other two species. The calyx lobes are somewhat variable at the apex—in *P. Whitei* they are longer than the tube, and are somewhat deeply 3- to 5-lobed at the apex, with rather narrow finger-like lobes, whereas in the other two species the lobes are shorter than the tube, and are entire or more or less denticulate or sublobulate. The large corollas have their lobes varying from denticulate in *P. Whitei* to almost fringed, as often occurs in *P. sonchifolia*. The depressed globose capsule is subequal to the calyx tube.

4. Agreeing with the last group in that the flower and leaf development are simultaneous, or practically so, are four species which occur in the Himalayas from Nepaul westwards, viz. *P. nana*, *P. Edgeworthii*, *P. Winteri*, and *P. saxicola*. The bud scales again are persistent at flowering time, but they are fewer in number and are more or less recurved, and not rigidly erect and so giving a more or less cylindrical shape to the base of the plant. This character, in conjunction with the leaf dimorphism, gives us the distinguishing marks of the group. The leaves which are present at flowering time, and which are still expanding, are mostly spathulate or obovate, and are narrowed into a broadly winged, scarcely differentiated petiole. After flowering these leaves disappear, and their place is taken by long petioled leaves, more or less ovate in shape, and truncate or cordate at the base, which are developed from a lateral bud or from lateral buds. In the centre of each lateral bud is developed the large, usually farinose, winter bud. The scape is not appreciable, or may attain a slight elongation. The calyx is green, and again we have variation in the amount of toothing of the lobes. For the most part the lobes are entire, but solitary teeth or almost lobules on one or both sides are not infrequent. The corolla

is large, with its lobes regularly or irregularly denticulate. The depressed globose capsule is included in the calyx tube or slightly exserted from it.

It is necessary now to say something of the plant named *P. nana*, by Wallich, as distinct from what is meant by *P. nana* of later authors. In the Calcutta herbarium there are two sheets of Wallich's type, consisting of very incomplete material. There is no corolla, no fruit, and none of the later developed leaves, but from the general habit of the plant there can, I think, be little doubt as to its inclusion in this group. In fact the only character by which I could distinguish this incomplete material from the well-known *P. Winteri* was in the calyx lobes having a more decidedly pinnate nervation.

Again, as regards *P. saxicola*, it would be well to note that while good flowering specimens have not been seen, its affinity with *P. Edgeworthii* can scarcely be doubted. In fact so similar are the two that one of the specimens on which *P. saxicola* was founded was quoted by Pax * under his *P. Edgeworthii*.

5. In this group, which occurs in the Himalayas from Tibet and Bhutan westwards, as also in the remaining two groups, we depart from the coetaneous flower and leaf development, and likewise—unless occasionally in *P. petiolaris*—from the persistent bud scales. Here we have plants with a dense rosette of leaves, of which at least the outer are fully formed at flowering time. Flowers in the majority are numerous, and are borne on a scape which is so reduced that it may be said to be wholly wanting. The seven representatives of the group may be conveniently divided into two lots, depending on the lobing or toothing of the corolla :—

(*a*) Corolla lobes rather deeply divided into two, or more rarely three, lobules, which are oblong with a rounded apex—*P. sulphurea* and *P. Drummondiana* from N.W. Himalayas, and *P. Cunninghamii* from East Sikkim and Tibet. *P. Drummondiana* can readily be distinguished from its allies by the multicellular glandular hairs on the upper surface of the leaf towards the margin, and *P. sulphurea* by the character which suggested the name—the abundant sulphur farina which persists on the lower surface of the leaf.

(*b*) Corolla lobes acuminate or 3-toothed, sometimes irregularly toothed, the teeth more or less deltoid and acute—*P. sessilis* from N.W. Himalayas, *P. petiolaris* from Nepaul, *P. Scullyi* from Nepaul and Sikkim, and *P. deuteronana* and *P. gracilipes* from Sikkim. Of these probably the most easily recognised is *P. petiolaris* with its outer, elliptic, long petioled leaves, and its rather long and finely attentuate calyx lobes.

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* Engler Pflanzenr. Primulaceae, p. 41.

In the others these petioled leaves are wanting at flowering time or only casually present. *P. deuteronana*, the only species of the section with the corolla tube villous inside, is easily recognised by that character, as also by its rather thick, more or less bullate leaves which dry a pale green. *P. sessilis* has long, often aristate-acuminate, calyx lobes, and the corolla lobes are nearly always caudate-acuminate. *P. gracilipes* can be distinguished from *P. Scullyi* by its green, not brown, calyx, its narrower leaves and longer pedicels.

6. In *P. irregularis* and *P. scapigera* from West Sikkim, *P. Boothii* from Bhutan, *P. bracteosa* from Bhutan and East Sikkim, and *P. moupinensis* from China, we have a set of plants closely allied to the last, but usually much larger, and with a scape more or less conspicuous at flowering time, and quite elongate in fruit. The leaves in fruit are characterised by some being long petioled and often cordate or truncate at the base. The depressed globose capsule is included in the calyx, and is shorter than the calyx tube or subequal to it. Of these *P. irregularis* with its oblong calyx lobes, variable at the apex, and its dense coating of stalked capitate glands on the pedicels and on the outside of the calyx is very distinct. *P. Boothii*, of which Griffith * gives an excellent figure, has the scape rather short or scarcely developed, and is distinguished from *P. scapigera* by the regular toothing of the corolla lobes and by the corolla in bud being farinose. *P. bracteosa*, at least in fruit, has some of the inner bracts expanded into well-developed petioled leaves.

7. The last group includes only Chinese representatives—*P. odontocalyx* and *P. hupehensis*. So far as habit is concerned, they might be reckoned intermediate between the last two groups. In size they belong to the *sessilis* alliance, but here a distinct scape is found. Again, in the lobing of the corolla lobes they resemble *P. sulphurea* and its allies. A distinct annulus is developed at the top of the tube. No fruiting specimens have been seen of either species. From the photographs examined, and also from the available specimens, the writer is strongly of opinion that Farges' collection, which is the type of *P. odontocalyx*, consists of two species. In the key and enumeration the species is limited to the specimens collected by Faber, which agree with Wilson, 1831, in the shallowly denticulate leaves and obconical calyx, whose lobes show almost constantly the character on which Franchet founded his specific name. The other specimens collected by Farges, probably identical with the plant collected by Henry and named *P. hupehensis*, can be easily distinguished by the erose-denticulate leaves and nearly cylindrical calyx.

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* **Griffith, Ic. Pl. As., vol. iv, t. 485, fig. 2.**

KEY TO THE SPECIES.

In the following key it must be noted that the true *P. nana* is omitted. This omission has been necessitated by the scanty material available of this species. As explained above, Wallich's *P. nana* is very closely allied to the well-known *P. Winteri*.

Leaves not fully developed when flowers open, i.e. flowers and leaves coetaneous or approximately so.
- Leaves glandular pubescent on both surfaces, margin usually rather deeply toothed, sometimes lobulate; scape developed though sometimes very short, pedicels and calyx glandular-pilose; calyx lobes subequal to or shorter than the tube, usually 3-toothed, sometimes irregularly toothed; corolla lobes usually sharply 3-lobed; efarinose plant, 2.5–6 cm. high . . . 3. *taliensis.*
- Leaves glabrous or with short glandular papillae; farinose or not.
  - Flowers white, comparatively small, quite immersed in the rosette of leaves or just overtopping the leaves, appearing as if quite sessile; base of plant closely invested by imbricate scales and sheathing leaf-bases.
    - Calyx not markedly veined, its lobes more or less deltoid, not or scarcely imbricate; whole plant at flowering time 1–2 cm. high and 1–3 cm. diameter . . . . . 1. *Hookeri.*
    - Calyx markedly veined, its lobes rounded, strongly imbricate; whole plant at flowering time 2.5–7 cm. diameter. 2. *vernicosa.*
  - Flowers not immersed in the leaves but with distinct pedicels; scape present or not.
    - Calyx lobes shorter than the tube, corolla tube annulate.
      - Leaves oblanceolate, deeply lobulate, the lobules incised-dentate, scape shorter than the leaves; otherwise very similar to *P. sonchifolia* . . . . 4. *taraxacoides.*
      - Leaves broadly oblanceolate or more often oblong to elliptic, shallowly lobulate, the lobules dentate; scape at flowering time subequal to or longer than the expanding leaves, usually many-flowered; pedicels 6–20 mm. long; outer bracts 3–5 mm. long, broad at base; corolla blue or white, the lobes usually more or less fringed; closely imbricating, rigid bud scales persistent at flowering; sulphur farina nearly always present . . . . 5. *sonchifolia.*
    - Calyx lobes subequal to or longer than the tube.
      - Calyx lobes oblong, trilobed or rarely 4–5 lobed at the apex; scape at flowering time much shorter than the leaves, many-flowered; bracts narrow, about 1.5 cm. long; pedicels about 3–3.5 cm. long; corolla annulate, the lobes more or less dentate; scales at base as in *P. sonchifolia*; farina present . . . . 6. *Whitei.*
      - Calyx lobes acute or acuminate, only casually few-lobed or toothed.
        - Corolla lobes regularly toothed or sinuate-toothed along the margin; bud scales persisting at flowering time; leaves glaucous like pedicels and calyx with pale farina, during flowering spathulate or obovate-spathulate narrowed into a winged petiole, succeeded by larger leaves long petioled and truncate or cordate at the base, in the centre of which

is developed the winter bud; scape 0 or if present shorter than the leaves; bracts broad only at the very base, the outer ones 5–8 mm. long; pedicels 4–7 cm. long, the flowers equalling or overtopping the leaves . . . . 7. *Winteri*.

Corolla lobes 3-toothed or irregularly toothed or lobulate.

Calyx brown or pale brown, its lobes narrow and long attenuate with one prominent median nerve, only occasionally denticulate near the apex; bud scales very rarely persisting at flowering time; outer long petioled leaves elliptic or ovate-elliptic nearly always present, inner leaves more or less spathulate, narrowed into broadly winged petiole; scape not developed; efarinose . . . . . . 18. *petiolaris*.

Calyx green, its lobes rather broad and not long attenuate.

Calyx lobes, especially in fruit, markedly 3-nerved (1 median, 2 intramarginal); fruit slightly exserted from calyx tube; leaves membranous, green, those surrounding the escapose inflorescence spathulate or elliptic-spathulate, narrowed into distinct petiole, succeeded in fruit by larger ovate leaves, long petioled and cordate at the base, in the centre of which is developed the winter bud . 10. *saxicola*.

Calyx lobes without the conspicuous intramarginal nerves; fruit included in calyx tube; some of the bud scales persisting at flowering time; flowers subequal to or slightly overtopping the expanding farinose leaves; succession of leaves as in *P. Winteri* . . . . . . 9. *Edgeworthii*.

Leaves fully developed at the time the flowers open; bud scales deciduous before flowering.

Leaves distinctly glandular pubescent on the upper surface, either all over or towards the margin only.

Leaves pubescent all over the upper surface, and also on the lower, especially on midrib and nerves, margin usually rather deeply toothed, sometimes lobulate; scape developed though sometimes very short; pedicels and calyx glandular-pilose; calyx lobes mostly 3- or irregularly toothed, subequal to or shorter than the tube; corolla lobes mostly sharply 3-lobed; efarinose . . . . 3. *taliensis*.

Leaves pubescent on upper surface only towards the repand-denticulate margin; scape not developed; pedicels and calyx glabrous or with minute glandular papillae only; calyx lobes entire, decidedly longer than tube; corolla lobes bilobed; sparsely farinose . . . . . . 12. *Drummondiana*.

Leaves glabrous or with minute glandular papillae only.

Scape wanting, or if present very short and quite concealed by the dense foliage.

Corolla lobes emarginate or rather deeply 2- or 3-lobed, the lobules oblong and rounded at the apex; leaves in a dense rosette, all uniform and sessile or with a broadly winged scarcely differentiated petiole.

Corolla lobes emarginate, the tube 15 mm. long; scape usually present . . . . 20. *moupinensis*.

Corolla lobes rather deeply 2- or 3-lobed, the tube 7.5–10 mm. long; scape not developed.

Leaves with a dense coating of sulphur farina on the under surface; pedicels 1.5–2 cm. long . . 11. *sulphurea.*

Leaves efarinose or with sparse whitish or pale yellow farina; pedicels not exceeding about 1 cm. in length . . . . 13. *Cunninghamii.*

Corolla lobes acuminate or shallowly 3-lobed or irregularly lobed or dentate, the lobules or teeth triangular, acute or acuminate, sometimes obtuse but not rounded at the apex.

Corolla tube villous inside towards the apex; leaves in a dense rosette, sessile or the outer with broadly winged short petioles, coriaceous, drying pale dull green, the broad midrib and the lateral nerves prominent below; calyx lobes entire or casually tridentate at the apex; almost efarinose at flowering time, densely sulphur-farinose before flowering . . . . 17. *deuteronana.*

Corolla tube glabrous inside or with minute hairs only.

Corolla lobes distinctly acuminate or if tridentate then the central tooth acuminate; leaves sessile or with a short or occasionally fairly long winged petiole, rather thin, efarinose; calyx lobes entire, aristate or almost aristate-acuminate . . . . 16. *sessilis.*

Corolla lobes or their teeth not acuminate (most often acute, very rarely subacuminate, but never distinctly long-acuminate).

Outside of calyx and the pedicels very densely covered with glandular papillae; leaves in a dense rosette, the inner oblong, sessile, the outer more or less elliptic, long petioled; buds with dense pale yellow farina; calyx lobes nearly always trilobulate . . . . 19. *irregularis.*

Outside of calyx and the pedicels minutely and sparsely puberulous or farinose, calyx lobes exceptionally tridentate.

Calyx brown or reddish-brown.

Corolla in bud farinose, its lobes regularly and subequally 3-toothed; leaves in a dense rosette, as in *P. irregularis*, but outer petioled leaves sometimes wanting; short scape sometimes present; calyx lobes entire or casually tridentate . . . . 21. *Boothii.*

Corolla in bud efarinose, its lobes usually unequally 3-toothed, but often irregularly toothed.

Scape present, though sometimes quite short, and included in the dense rosette of leaves which are all sessile, or with a short and broadly winged petiole, with occasionally the outer long petioled leaves still present; calyx lobes entire, acuminate, acute . . . . 23. *scapigera.*

Scape wanting.

Leaf margin erose-denticulate, leaves all sessile, or a few outer ones with winged petioles about as long as the lamina, calyx lobes entire, acute or acuminate . . . . 15. *Scullyi.*

Leaf margin repand-denticulate, outer leaves with distinct petiole longer than the lamina, calyx lobes narrow, long attenuate at apex . . . . 18. *petiolaris.*

Calyx green, scape not developed.

Leaves membranous, irregularly coarsely toothed or lobulate with the lobules toothed, later ones differing from earlier ones in being larger, cordate at base and long petioled, corolla lobes longer than broad . . . . . . 10. *saxicola*

Leaves chartaceous, sharply erose-denticulate, all similar in shape, but the outer with longer and more distinct petioles, none cordate at base, corolla lobes nearly as broad as long . . 14. *gracilipes.*

Scape present equal to or longer than the leaves or, if shorter than the leaves, still quite conspicuous owing to the lax foliage.

Corolla lobes 3-toothed or more or less irregularly toothed.

Calyx lobes spreading or subspreading, long and finely attenuate-acuminate or almost aristate-acuminate, the acumen often spirally twisted; leaves during flowering all uniform, spathulate or oblong-spathulate, sessile, or with short, broadly winged petiole, or a few with distinct long petioles, during fruiting ovate or occasionally elliptic leaves usually truncate at the base, with petiole much longer than lamina, developed from lateral buds; corolla lobes irregularly toothed, usually rather deeply 2–3-lobed, with the lobules many-toothed; fruit included in calyx tube, the markedly stiff calyx lobes persistent . . . . 23. *scapigera.*

Calyx lobes acute or variously toothed or lobulate; leaves at flowering time dimorphous—some sessile or with a very broadly winged scarcely distinct petiole, others with a distinct long petiole subequal to or longer than the lamina.

Outer petioled leaves cuneate or acuminate, rarely subtruncate at base, margin sharply denticulate; none of the bracts expanded into petioled leaves; pedicels and calyx during flowering very densely covered with stalked capitate glands; calyx lobes not spreading and not very rigid, oblong, irregular at apex, rounded, shortly obtusely acuminate or more often 3-lobulate; corolla lobes sinuate dentate; capsule included in calyx tube 19. *irregularis.*

Outer petioled leaves truncate or cordate at the base, rarely cuneate, margin duplo-dentate; some of the inner bracts nearly always expanded into petioled leaves; pedicels and calyx during flowering puberulous with stalked capitate glands; calyx lobes not very rigid, variable in shape, mostly narrowly deltoid or oblong-deltoid, acute or shortly acuminate at apex; corolla lobes 3-toothed; capsule subequal to calyx tube . . 22. *bracteosa.*

Corolla lobes emarginate or rather deeply bilobed, the lobules entire, rounded at apex.

Leaves rather shallowly repand-denticulate or denticulate, few in number and rather lax, usually elliptic or oblong-elliptic; scape 2-flowered; whole calyx obconic; corolla tube annulate . . . . . 25. *odontocalyx.*

Leaves sharply erose-denticulate, dense or subdense, oblanceolate to obovate; scape 2–6-flowered, but rarely 2-flowered; calyx cylindrical to campanulate; corolla tube annulate or not.

Corolla tube annulate; leaves not very dense, petioled at flowering time, the petiole usually rather broadly winged . . . . 24. *hupehensis.*

Corolla tube exannulate; leaves at flowering time dense, sessile or with a scarcely distinct broadly winged petiole, occasionally a few outer long petioled leaves still persisting . . . . 20. *moupinensis.*

ENUMERATION OF THE SPECIES, WITH SYNONYMY AND DISTRIBUTION.

1. **P. Hookeri,** Watt in Journ. Linn. Soc., vol. xx, p. 14, t. 8B (1882); Hook. f., Fl. Brit. Ind., vol. iii, p. 494; Pax in Engler Bot. Jahrb., vol. x, p. 175; Watt in Journ. Roy. Hort. Soc., vol. xxix, pp. 300 et 320; Pax in Engler Pflanzenr. Primulac., p. 41.

Sikkim, 12,000 ft., Hook. f., Primula No. 25 (Herb. Kew et Calc.—type); Eumtso-la, 14,500 ft., open ground among scant herbage, Cave, 184 (Herb. Calc.); ibid., 15,000 ft., Smith et Cave, 1528 (Herb. Calc.); Tholoong, 14,000 ft., King's collector (Herb. Calc.).

2. **P. vernicosa,** F. K. Ward in Notes Roy. Bot. Gard. Edin., vol. ix, p. 203 (1916).

Yunnan, Mekong-Salween divide, W. slope, 12,000 ft., Ward, 94 (Herb. Edin.—type).

Upper Burma, Doker-la, Ka-gwr-pw, 14,000 ft., Ward, 974 (Herb. Edin.—type).

Cult. Hort. Edin.

3. **P. taliensis,** G. Forrest in Notes Roy. Bot. Gard. Edin., vol. v, p. 220, t. xxxii (1908).

Yunnan, eastern flank of the Tali range, 10,000–11,000 ft., open stony pasture land, Forrest, 1805 (Herb. Edin.—type); Shweli-Salween divide, open stony moist pasture, Forrest, 11,942 (Herb. Edin.); hills beyond Teng-yueh, Howell, 144 (Herb. Edin.).

4. **P. taraxacoides,** Balf. f. in Notes Roy. Bot. Gard. Edin., vol. ix, p. 49 (1915).

Yunnan, rocks of Ma-long, 9000 ft., E. E. Maire (Herb. Bonati—type).

5. **P. sonchifolia,** Franchet in Bull. Soc. Bot. Fr., vol. xxxii, p. 266 (1885); Pax in Engler Bot. Jahrb., vol. x, p. 218; Forbes et Hemsl. in Journ. Linn. Soc., vol. xxvi, p. 43; Pax in Engler Pflanzenr. Primulac., p. 129.

P. gratissima, G. Forrest in Notes Roy. Bot. Gard. Edin., vol. v, p. 219, t. xxxB, xxxi (1908).

Yunnan, Tali range, 11,000–13,000 ft., Forrest, 1808, 1812, 11,618 (Herb. Edin.); Lichiang range, 9000–14,000 ft., Forrest, 2167, 6521, 6723, 10,089 (Herb. Edin.); Mountains of Chiengtien plateau, 12,000–14,000 ft., Forrest, 12,403 (Herb. Edin.); Tsangchan, Delavay, sine num., Delavay, 750 (Herb. Edin.); Mo-so-yn, Delavay (Herb. Edin.); N.W. Yunnan, Monbeig, 175 (Herb. Edin.); Yunnan, Maire (Herb. Edin.); N.W. Yunnan and E. Tibet, Ward (Herb. Edin.).

Upper Burma, Irrawaddy-Salween divide, Hpimaw Pass, Ward, 1572 (Herb. Edin.).

6. **P. Whitei,** W. W. Smith in Rec. Bot. Surv. Ind., vol. iv, No. 5, p. 268 (1911).

Bhutan, Pile-la, 10,100 ft., White, 122 (Herb. Calc.—type); ibid. by stream under Rhododendron scrub, 10,500 ft., Cooper, 3970 (Herb. Edin.); Tongsa, Yato-la, 11,000 ft., Cooper, 4213 (Herb. Edin.); Yato-la ridge, 10,000–11,000 ft., Cooper, 4134 (Herb. Edin.); Pumthang, 12,000 ft., Cooper, 4122 (Herb. Edin.).

7. **P. Winteri,** W. Watson in Gard. Chron., vol. xlix, p. 130, fig. 63 (1911); Craib in Journ. Roy. Hort. Soc., vol. xxxix, p. 186, fig. 89.

P. petiolaris, Wall., var. *pulverulenta*, Hook. f., Fl. Brit. Ind., vol. iii, p. 493 (1882); Pax in Engler Bot. Jahrb., vol. x, p. 175; Pax in Engler Pflanzenr. Primulac., p. 41.

Kumaon, Pindree, 12,000 ft., Strachey and Winterbottom, Primula No. 9, pro parte (Herb. Kew), Madden, 350 (Herb. Edin.), Madden, sine num. (Herb. Kew); Namik, 12,000 ft., Madden, 563 (Herb. Kew); Champwa, 12,000 ft., Strachey and Winterbottom, Primula No. 9 (Herb. Calc.); Dhakouree and valley of Soonderdunga glacier, 13,000 ft., T. Anderson (Herb. Calc.); Wall. Cat., 603, pro parte (Herb. Calc.).

Cult. Hort. Kew, Edin., &c.

8. **P. nana,** Wall. in Roxb. Fl. Ind., vol. ii, p. 23 (1824), haud auct. posteriores.

Nepaul, Wall. Cat. 612 et sine num. (Herb. Calc.).

9. **P. Edgeworthii,** Pax in Engler Pflanzenr. Primulac., p. 41 (1905), pro parte.

P. petiolaris, Wall., var. *Edgeworthii,* Hook. f., Fl. Brit. Ind., vol. iii, p. 493 (1882); Pax in Engler Bot. Jahrb., vol. x, p. 175; Watt in Journ. Roy. Hort. Soc., vol. xxix, pp. 300 et 320.

P. petiolaris, Collett, Fl. Simlensis, p. 298, non Wall.

Simla, T. Thomson (Herb. Kew et Calc.); Hattu-killa, 10,400 ft., Dubuc (Herb. Edin.); Hattugarh, 10,500 ft., Gamble, 6116C, 6116D (Herb. Calc.); Hattu, 10,000 ft., Watt, 8362A (Herb. Edin.); Mathiana to Bagi, 8000–9000 ft., Watt, 8362 (Herb. Edin.).

Garhwal, Tungnath, 8000–9000 ft., Edgeworth, 463 (Herb. Kew—type); Tungnath, near temple, May 1874 (Herb. Edin., sine collectore).

Kumaon, Madhari Pass, 8000 ft., Strachey and Winterbottom, Primula No. 8 (Herb. Kew); Pindree, 11,500–12,000 ft., Strachey and Winterbottom, Primula No. 9, pro parte, No. 11, pro parte (Herb. Kew).

10. **P. saxicola,** Craib in Notes Roy. Bot. Gard. Edin., vol. vi, p. 254 (1917).

P. Edgeworthii, Pax in Engler Pflanzenr. Primulac., p. 41, quoad plantam Duthieanam, non *P. petiolaris,* Wall., var. *Edgeworthii,* Hook. f.

Kulu, 5000 m., Drummond, 8925 (Herb. Edin.—type); Chachpur valley, 6000 ft., Duthie, 21,067 (Herb. Kew et Calc.).

11. **P. sulphurea,** Craib in Journ. Roy. Hort. Soc., vol. xxxix, pp. 186 et 190 (1913).

P. petiolaris, Wall., var. *sulphurea,* Hook. f., Fl. Brit. Ind., vol. iii, p. 493 (1882); Pax in Engler Bot. Jahrb., vol. x, p. 175; Pax in Engler Pflanzenr. Primulac., p. 41.

Kumaon, below Suring, 4500 ft., Strachey and Winterbottom, 247 (Primula No. 10, Herb. Calc. et Kew—type).

12. **P. Drummondiana,** Craib in Journ. Roy. Hort. Soc., vol. xxxix, pp. 186 et 190 (1913).

P. petiolaris, Wall., var. *Stracheyi,* Hook. f., Fl. Brit. Ind., vol. iii, p. 493 (1882); Pax in Engler Bot. Jahrb., vol. x, p. 174; Pax in Engler Pflanzenr. Primulac., p. 41.

Kumaon, above Namik, 8000 ft., Strachey and Winterbottom, 1803 (Primula No. 12, Herb. Calc. et Kew—type); pass above Namik, 8500 ft., Madden, 353 (Herb. Edin.).

13. **P. Cunninghamii,** King ex Craib in Notes Roy. Bot. Gard. Edin., vol. vi, p. 250 (1917).

P. petiolaris, Wall., var. *nana,* Hook. f., Fl. Brit. Ind., vol. iii, p. 493, pro parte ; Pax in Engler Bot. Jahrb., vol. x, p. 174, pro parte ? ; Pax in Engler Pflanzenr. Primulac., p. 40, pro parte ? non *P. nana,* Wall.

Sikkim, Jaffrey's collector (King's type—Herb. Calc.), 10,000 ft., Cunningham (Herb. Calc.), 13,000 ft., Gammie (Herb. Calc.), Cave, 7287 (Herb. Edin.) ; Lingtu and Natung, 11,000–13,000 ft., Pantling (Herb. Calc.) ; Natung, King's collector (Herb. Calc.) . Sheraothang, among gravel and turf, 13,000 ft., Cooper, 969 (Herb. Edin.) ; Changu, Cave (Herb. Edin.) ; below Changu, Ribu et Rhomoo, 4601 (Herb. Calc.) ; Chumbi Thang, Ribu, 9 (Herb Calc.).

Tibet, Younghusband, 21 (Herb. Calc.) ; Gyantse to Phari, Walton (Herb. Calc.).

14. **P. gracilipes,** Craib in Notes Roy. Bot. Gard. Edin., vol. vi, p. 252 (1917).

Sikkim, Yeumthang, 11,000 ft., Cave (Herb. Edin.—type) ; Begger, 12,500 ft., Cave (Herb. Edin.) ; Changu, 12,000 ft., Smith, 3287 (Herb. Calc.) ; Dickchoo, 11,000 ft., C. B. Clarke, 27,797B (Herb. Kew) ; ? Yatung, Hobson (Herb. Kew) ; ? Jang kar chha and up to Jang kar la, Walsh, 118 (Herb. Kew).

15. **P. Scullyi,** Craib in Notes Roy. Bot. Gard. Edin., vol. vi, p. 255 (1917).

P. nana, Watt in Journ. Roy. Hort. Soc., vol. xxix, pp. 300 et 320, saltem pro parte, fig. 73C, non Wall.

P. petiolaris, Wall., var. *nana,* Hook. f., Fl. Brit. Ind., vol. iii, p. 493, pro parte ; Pax in Engler Bot. Jahrb., vol. x, p. 174, pro parte ; Pax in Engler Pflanzenr. Primulac., p. 40, pro parte ; Bot. Mag., t. 7079B, non *P. nana,* Wall.

Nepaul, Scully (Herb. Calc.).

Sikkim, 13,000 ft., Watt, 5269 (Herb. Calc. et Edin.), Hook. f. (Herb. Calc. et Kew) ; Singaleelah range, 12,000 ft., Watt, 5263 (Herb. Edin. et Kew), 12,500 ft., Cave (Herb. Edin.) ; near Phallut, 11,500 ft., Lace, 2265 (Herb. Calc. et Kew) ; Tonglu, Elwes in Herb. C. B. Clarke, 27,482 (Herb. Kew) ? ; Yalloong valley wood, 10,000–12,000 ft., Hook. f. (Herb. Kew) ; Wallanchoon, 10,000–12,000 ft., Hook. f. (Herb. Kew) ; below Jongri, Pey kiong la, King's collector, pro parte (Herb. Calc.) ; above Lachen on moist exposed places, 11,000 ft., Pantling (Herb. Calc.).

P. Scullyi, Craib, var. **Searightii,** Craib in Notes Roy. Bot. Gard. Edin., vol. vi, p. 256 (1917).

Chumbi, 8000–9000 ft., Searight, 44 (Herb. Calc.) ; Pey goong la, King's collector, 433 (Herb. Calc.).

16. **P. sessilis,** Royle ex Craib in Notes Roy. Bot. Gard. Edin., vol. vi, p. 256 (1917),

P. petiolaris, Wall., var. *nana*, Hook. f., Fl. Brit. Ind., vol. iii, p. 493, pro parte ; Pax in Engler Bot. Jahrb., vol. x, p. 174, pro parte ; Pax in Engler Pflanzenr. Primulac., p. 40, pro parte, non *P. nana*, Wall.

P. petiolaris, Watt in Journ. Roy. Hort. Soc., vol. xxix, fig. 73a' non Wall.

N.W. India, Royle (Herb. Calc.), Cleghorn (Herb. Edin.) ; Chamba State, 8000 ft., Watt, 4273, pro parte (Herb. Edin.) ; Bashahr, Watt, 2877 (Herb. Edin.), Bági Forest, 8000 ft., Lace, 78 (Herb. Edin.) ; Jaunsar, Harké Dún, 11,000 ft., Rogers (Herb. Calc.) ; Kulu, 5000 m., Drummond, 8926 (Herb. Edin.) ; Simla, Govan (Herb. Edin.) ; Hattu, 10,000 ft., Gamble, 6117C (Herb. Calc.) ; Tihri Garwhál, 11,000–12,000 ft., Duthie, 14,520 (Herb. Calc.) ; Kidarkanta, 10,000–12,000 ft., Duthie, 1184 (Herb. Calc.), Gamble, 24,314, 24,360 (Herb. Calc.), Duthie (Herb. Edin. et Kew) ; Kumaon, Wall. Cat., 603, pro parte (Herb. Kew et Calc.), T. Anderson (Herb. Calc. et Edin.) ; Dhakouree and Soonderdunga glacier, T. Anderson (Herb. Calc.) ; Pindree, 11,000 ft., Collett, 123 (Herb. Calc.) ; Madhari Pass, 9000 ft., Strachey and Winterbottom, 659 (Primula No. 11, Herb. Calc.) ; Champwa, 12,000 ft., Strachey and Winterbottom, 247 (Primula No. 11, Herb. Calc.).

17. **P. deuteronana,** Craib in Notes Roy. Bot. Gard. Edin., vol. vi, p. 251 (1917).

P. petiolaris, Wall., var. *nana*, Hook. f., Fl. Brit. Ind., vol. iii, p. 493, pro parte ; Pax in Engler Bot. Jahrb., vol. x, p. 174, pro parte ; Pax in Engler Pflanzenr. Primulac., p. 40, pro parte, non *P. nana*, Wall.

P. Stirtoniana, Watt in Journ. Roy. Hort. Soc., vol. xxix, fig. 73B, non Watt in Journ. Linn. Soc., vol. xx, p. 15.

Sikkim, Nye gu la, 13,000 ft., King's collector (Herb. Calc.) ; Pey kiong la, below Jongri, King's collector, pro parte (Herb. Calc.) ; Singaleelah, Sirkia la, 14,000 ft., Watt, 5425 (Herb. Edin., Calc. et Kew) ; Singaleelah, Hook. f. (Herb. Kew).

18. **P. petiolaris,** Wall. in Roxb. Fl. Ind., vol. ii, p. 22 (1824); id., Tent. Fl. Nepal., p. 42 (pl. Blinkworth. excl.), t. 31; DC. Prodr., vol. viii, p. 37, saltem pro parte.

P. Cushia, Ham. Mss. in Herb. Mus. Brit.

P. tridentata, D. Don, Prodr. Fl. Nepal., p. 77 (1825), saltem pro parte.

P. petiolaris, Wall., var. *petiolaris proper*, Hook. f., Fl. Brit. Ind., vol. iii, p. 493 (1882).

P. petiolaris, Wall., var. *eupetiolaris*, Pax in Engler Bot. Jahrb., vol. x, p. 174 (1889); Pax in Engler Pflanzenr. Primulac., p. 40, saltem quoad pl. Wallichianam.

Nepaul, Wall. Cat., 603, pro parte (Herb. Calc., Edin. et Kew), Scully (Herb. Calc.).

The Singaleelah plant collected by Schlagintweit and referred by Pax to this species has not been seen by the writer. It is more likely to belong to the next species.

19. **P. irregularis,** Craib in Notes Roy. Bot. Gard. Edin., vol. vi, p. 253 (1917).

P. petiolaris, Wall., var. *nana,* Hook. f., Fl. Brit. Ind., vol. iii, p. 493, pro parte; Pax in Engler Bot. Jahrb., vol. x, p. 174, pro parte; Pax in Engler Pflanzenr. Primulac., p. 40, pro parte, haud *P. nana,* Wall.

Sikkim, Chowbhangin, Cave (Herb. Edin.); Singaleelah, Hook. f. (Herb. Kew); ibid., 11,000 ft., Elwes in Herb. C. B. Clarke, 27,481 (Herb. Kew); Tonglu, 10,000 ft., Rhomoo, 811 (Herb. Edin.)

19*a*. *P. sp. nov.* affinis *P. irregulari*, Craib, et *P. moupinensi*, Franchet.

P. petiolaris, Wall., var. *sulphurea*, Forrest in Notes Roy. Bot. Gard. Edin., vol. v, p. 219; Diels in Notes Roy. Bot. Gard. Edin., vol. vii, p. 25, non Hook. f.

Yunnan, ascent of Niu Chang Pass, 14,000 ft., Forrest, 304 (Herb. Edin.).

This Yunnan plant is in habit very similar to *P. irregularis*, but differs in the leaf margin. Unfortunately there is but the one collection in very young bud.

20. **P. moupinensis,** Franchet in Bull. Soc. Bot. Fr., vol. xxxiii, p. 67 (1886); id. in Nuov. Arch. Mus. d'Hist. Nat., vol. x, p. 57, t. 14B (1887); Pax in Engler Bot. Jahrb., vol. x, p. 175; id. in Engler Pflanzenr. Primulac., p. 42 (*mupinensis*).

Moupin, David.

Of this species only a photograph of the type has been seen.

21. **P. Boothii,** Craib in Notes Roy. Bot. Gard. Edin., vol. vi, p. 249 (1917).

P. petiolaris, Wall., var. *nana*, Hook. f., Fl. Brit. Ind., vol. iii, p. 493, pro parte ; Pax in Engler Bot. Jahrb., vol. x, p. 174, pro parte ; Pax in Engler Pflanzenr. Primulac., p. 40, pro parte, non *P. nana*, Wall.

Primulae sp., Griff. Itin. Notes, p. 135 ; Griff. Ic., t. 485, f. 2.

Bhutan, Chardwar, Booth ? (Herb. Edin.) ; Tengepane and Meru mountains, Booth ? (Herb. Calc.) ; Booth ex Herb. Nuttall (Herb. Calc.) ; Simons (Herb. Edin.) ; Griffith, K. D. 3514 (Herb. Calc.) ; Griffith, 2315, 582—K. D. 3514, pro parte (Herb. Kew).

22. **P. bracteosa,** Craib in Notes Roy. Bot. Gard. Edin., vol. vi, p. 250 (1917).

P. petiolaris, Wall., var. *scapigera*, Hook. f., Fl. Brit. Ind., vol. iii, p. 494 ; Pax in Engler Bot. Jahrb., vol. x, p. 175 ; Pax in Engler Pflanzenr. Primulac., p. 41, quoad plantas bhutanenses ; Watt in Journ. Roy. Hort. Soc., vol. xxix, p. 320.

Bhutan, Tongsa, Yato la, 10,000 ft., in moss by tree bases in shady forest, Cooper, 3981 (Herb. Edin.) ; Timpu, Duké la, 9000 ft., sandy soil in shade of light wet forest, Cooper, 3917 (Herb. Edin.) ; ascent to Woolooka, 8000–9500 ft., Griffith, K. D. 3514, pro parte (Herb. Kew) ; Griffith, K. D. 2314 (Herb. Kew).

Sikkim, Lachoong, 9000 ft., Pantling (Herb. Calc.) ; by road below Changu, 11,000 ft., Smith, 3183 (Herb. Calc.).

23. **P. scapigera,** Craib in Notes Roy. Bot. Gard. Edin., vol. vi, p. 254 (1917).

P. petiolaris, Wall., var. *scapigera*, Hook. f., Fl. Brit. Ind., vol. iii, p. 494 ; Pax in Engler Bot. Jahrb., vol. x, p. 175 ; Pax in Engler Pflanzenr. Primulac., p. 41, quoad plantas sikkimenses.

P. petiolaris, Watt in Journ. Roy. Hort. Soc., vol. xxix, pp. 300 et 320, fig. 73A.

Sikkim, 8000–12,000 ft., Hook. f. (Herb. Calc., pro parte, Herb. Kew) ; Tonglu, 9000–10,000 ft., King (Herb. Calc.), Anderson, 259 (Herb. Calc.), Gamble, 9473 (Herb. Calc.), Gammie (Herb. Calc.), Lister (Herb. Calc.), Lace, 2264 (Herb. Calc. et Kew), Watt, 7013 (Herb. Edin. et Kew) ; Tonglu to Sandakphu, 7000–10,000 ft., Watt, 5331 (Herb. Edin.) ; Sandakphu, 11,000 ft., C. B. Clarke, 35,681B (Herb. Calc.), 35,681A (Herb. Kew) ; Phalut, 10,000 ft., Gammie, 62 (Herb. Calc.).

Included in the above are several rather well-marked varieties or microforms, but the material to hand is not sufficient to justify their segregation. On the descent from Jongri Watt collected in the pine forest at 10,000 ft. (Watt, 5615, in Herb. Edin. et Kew) a scapigerous plant very different from the type in being much weaker and in having thinner, more deeply cut leaves and much smaller fruit.

24. **P. hupehensis,** Craib in Notes Roy. Bot. Gard. Edin., vol. vi, p. 252 (1917).

Hupeh, Fang, Henry (Herb. Kew—type).

25. **P. odontocalyx,** Pax in Engler Pflanzenr. Primulac., p. 41 (1905).

P. petiolaris, Wall., var. *odontocalyx*, Franchet in Morot, Journ. de Bot., vol. ix, p. 449 (1895) ; Diels in Engler Bot. Jahrb., vol. xxix, p. 520.

P. tenuissima, Pax in Engler Pflanzenr. Primulac., p. 42 (nomen tantum), pro parte.

Szechuan, near Chenkow-tin, Farges (Herb. Edin.).
Hupeh, Fang, 7400 ft., wet rocks, Wilson, 1831 (Herb. Edin.).

Vol. VI. FOR OFFICIAL USE. Additional Plate Number.

NOTES

FROM THE

ROYAL BOTANIC GARDEN, EDINBURGH.

Addition to Numbers XXIX-XXX (January 1917).
Issued June 1921.

CONTENTS.

Plates I-XXXVII illustrating
Mr Takeda's paper on the Genus Mahonia.

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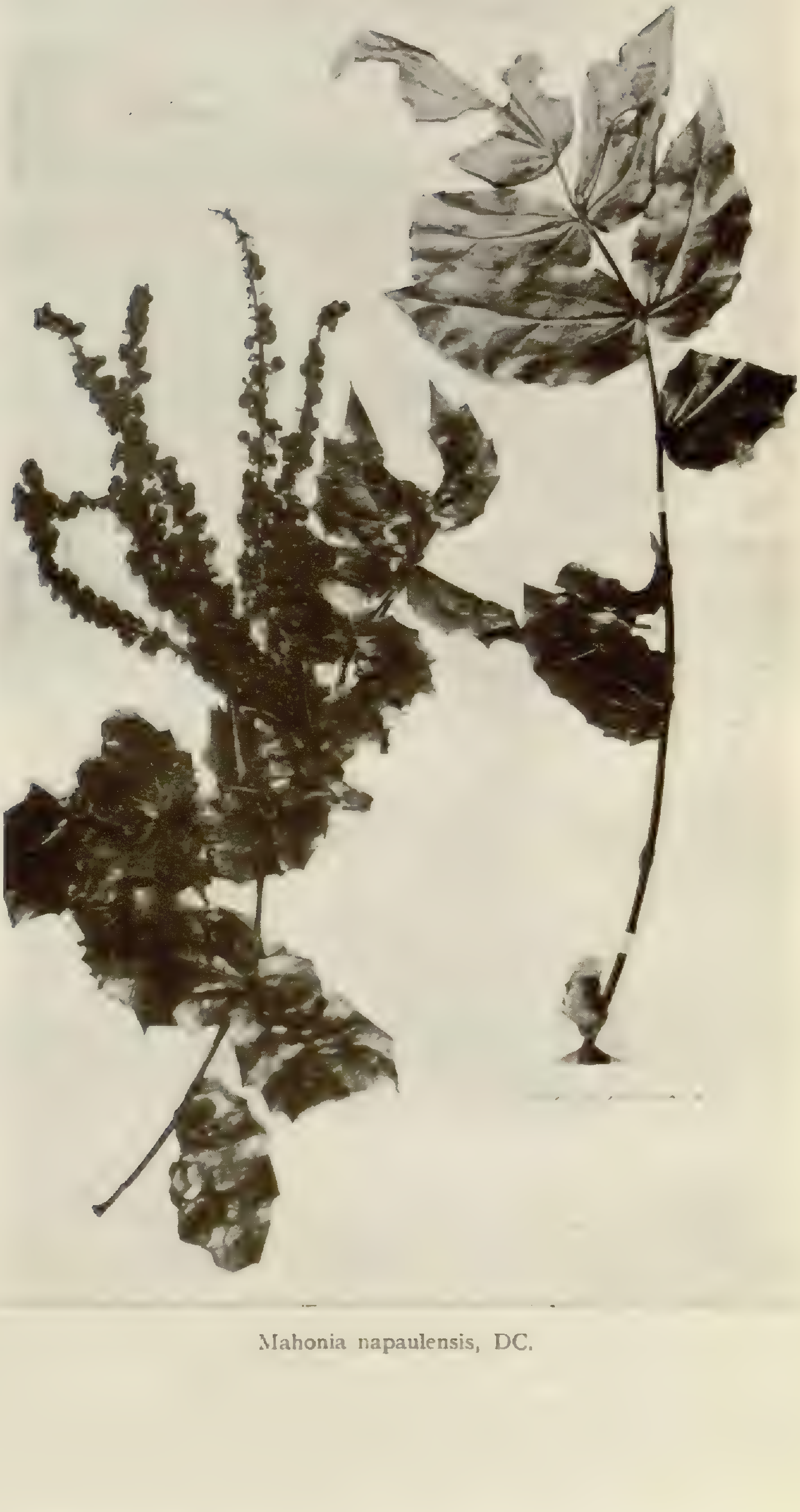
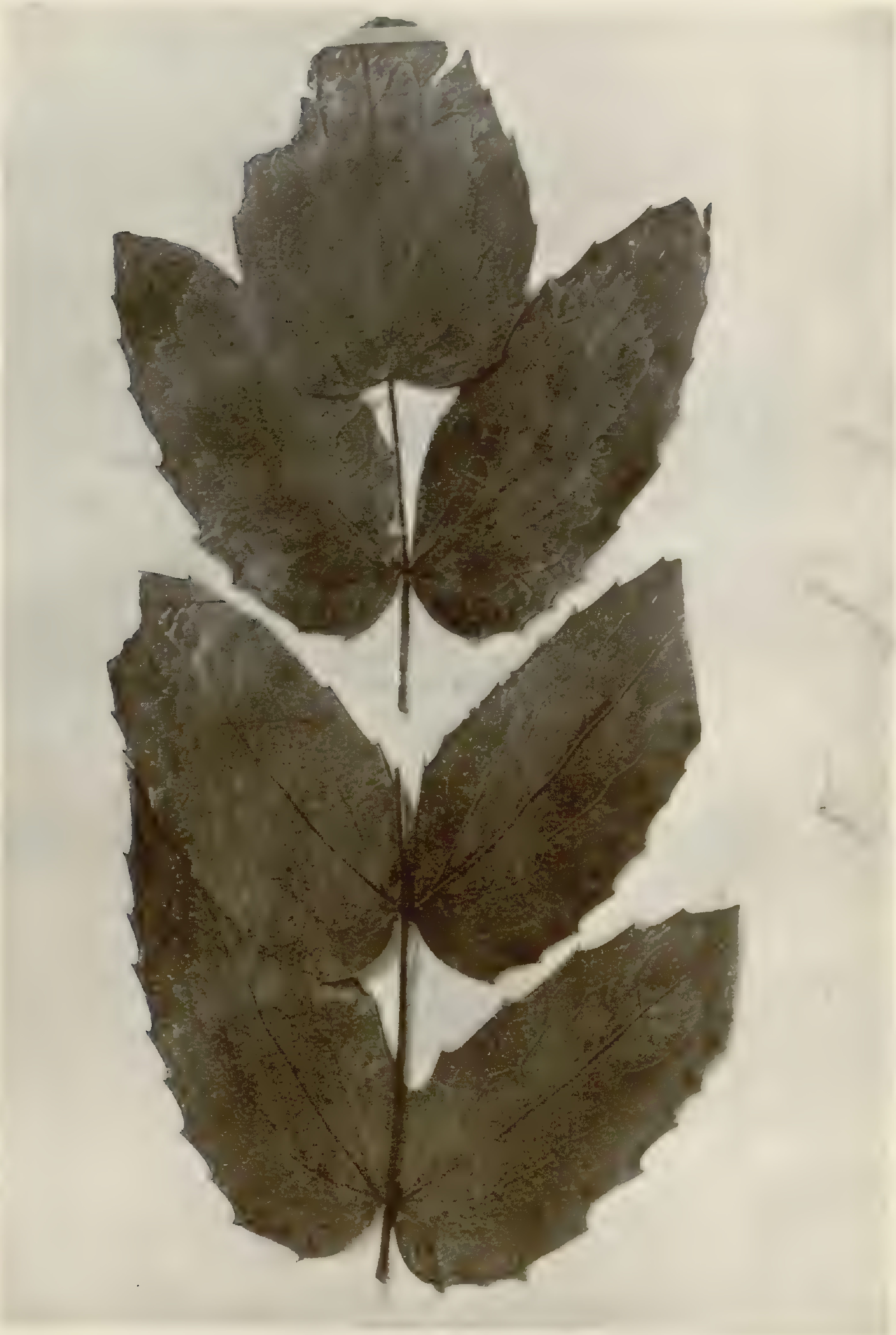
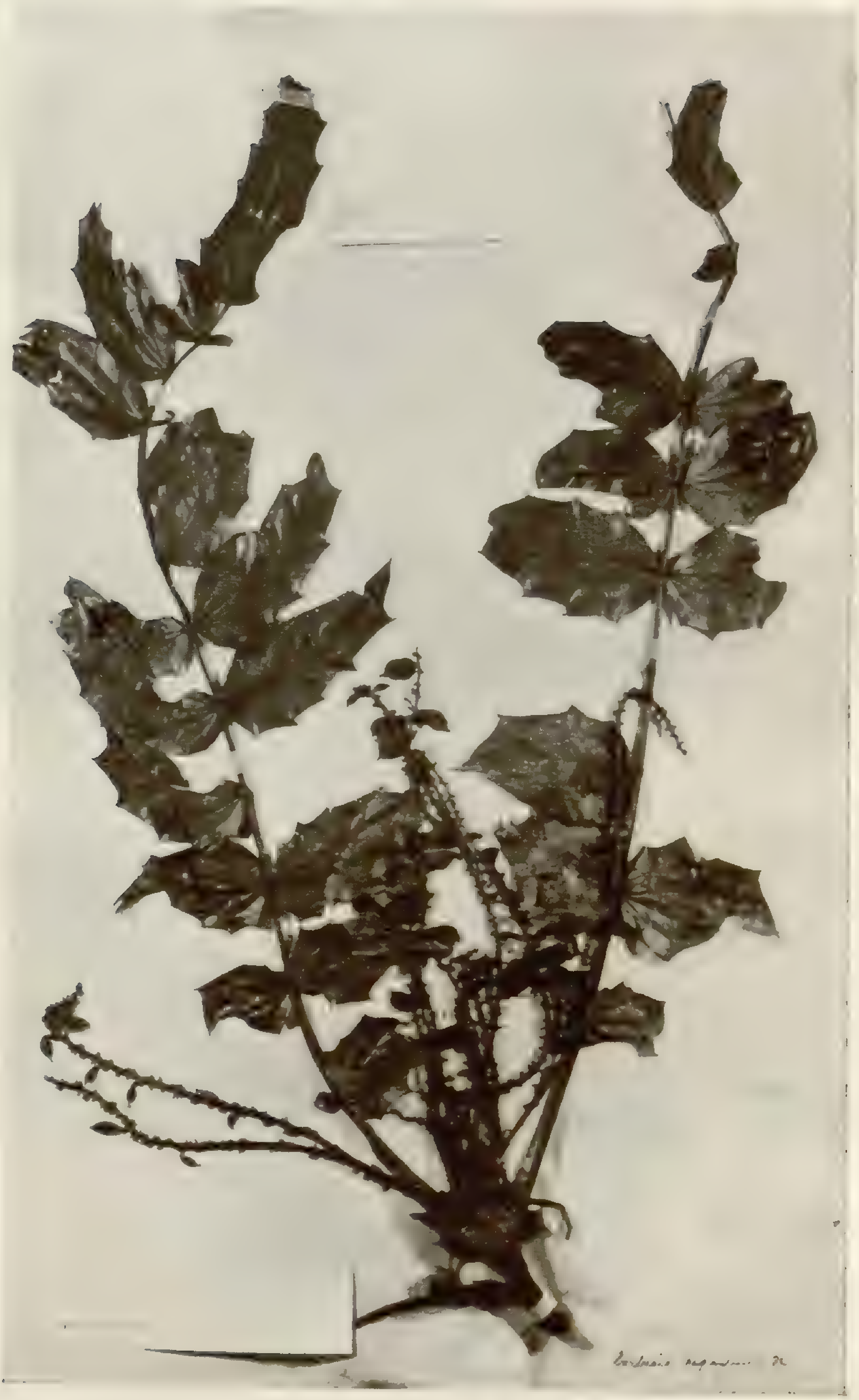


Mahonia napaulensis, DC.

(102D) Wt 3438/164 375 11/21 J.P. G7 sc. B

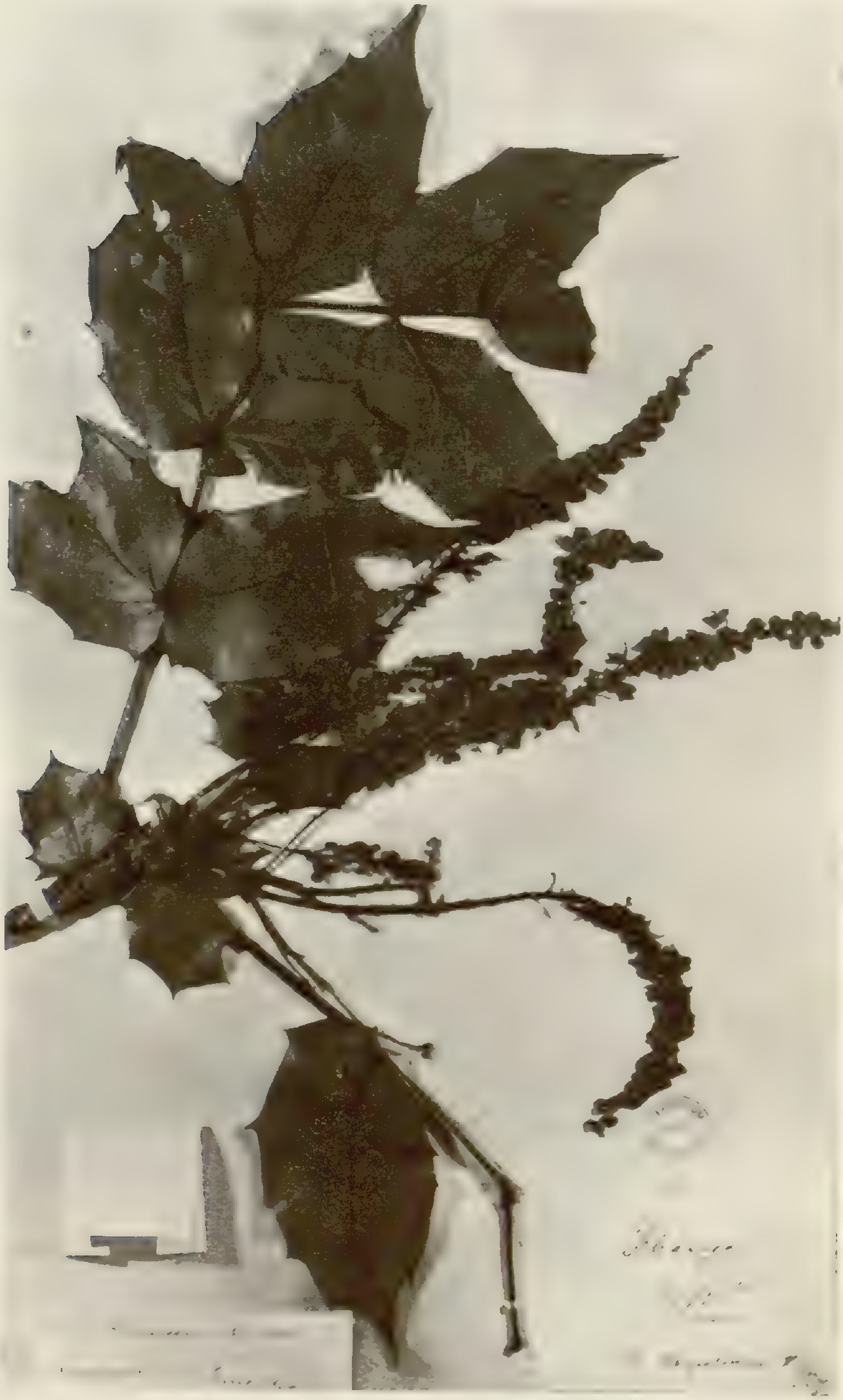


Mahonia napaulensis, DC.



Mahonia Griffithii, Takeda.

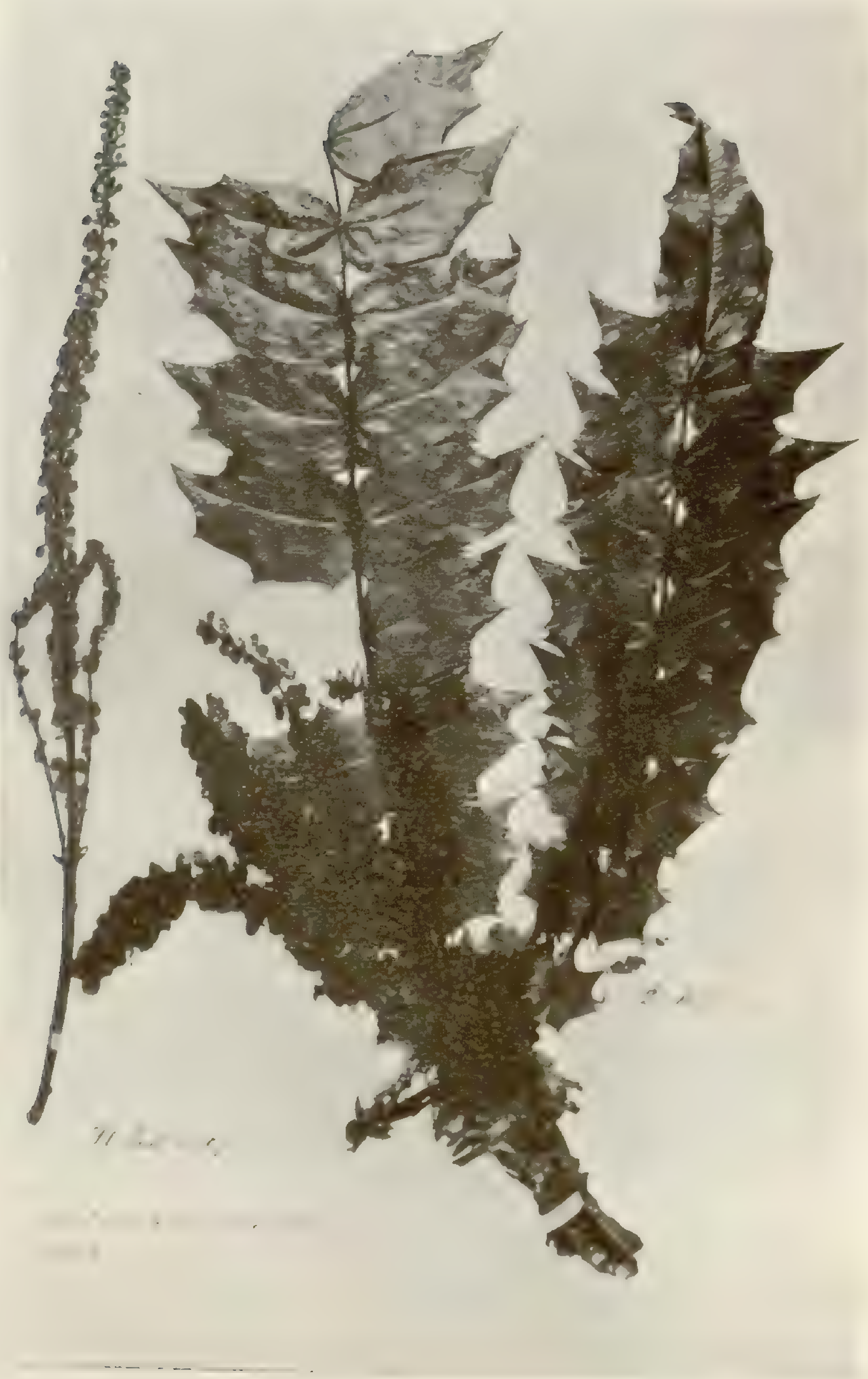
PLATE IV.



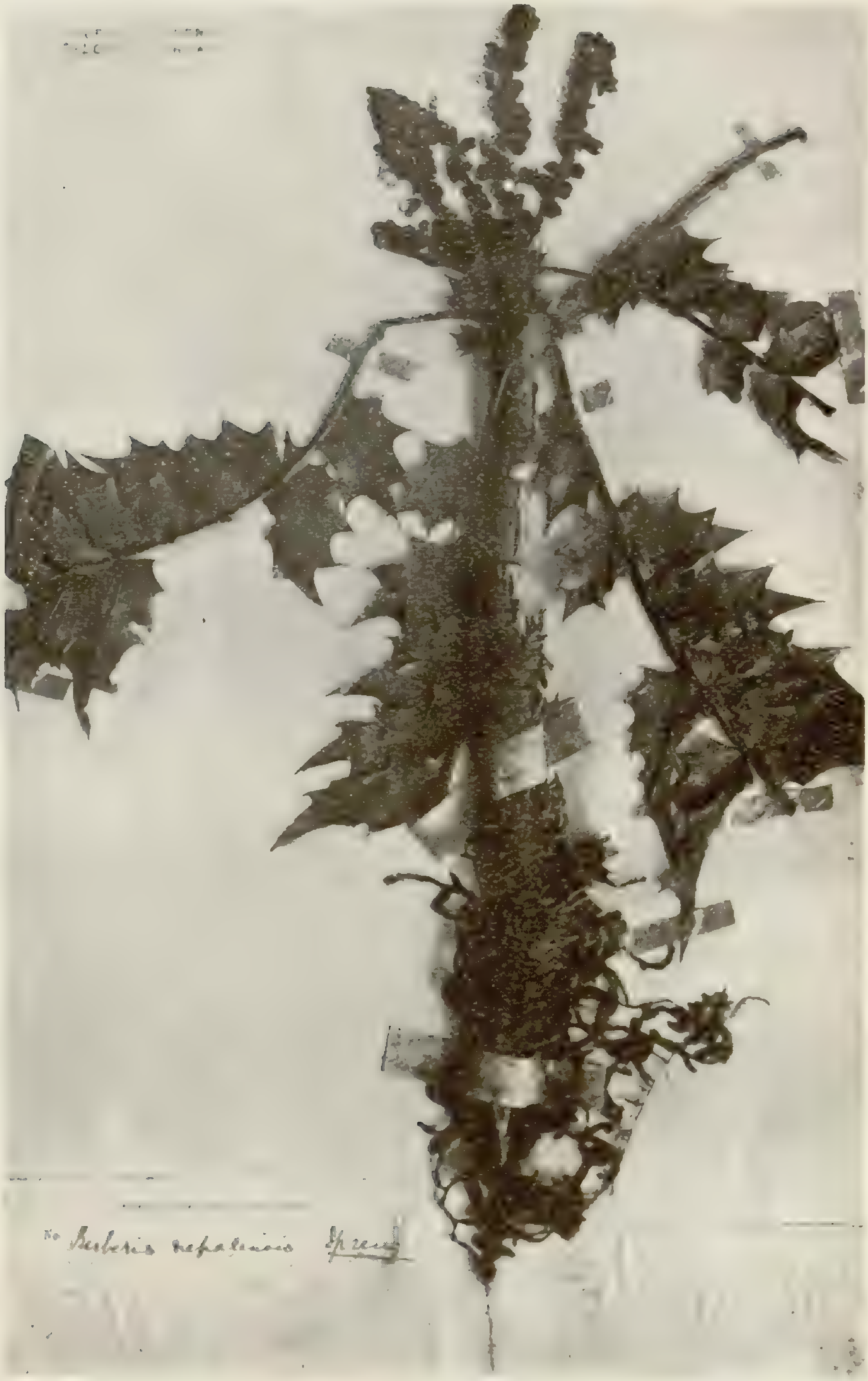
Mahonia pycnophylla, Takeda.

M. Roxburghii (DC.)
Determinavit H. Takeda. June 1914
Herb. Francis (Buchanan) Hamilton, M.D., F.R.S.
(Presented to University of Edinburgh
Original Number 342
Name etc., from Dr. H.'s MS Catalogue.
Berberis pinnata, Hort. Beng. 25
Mahonia nepalensis

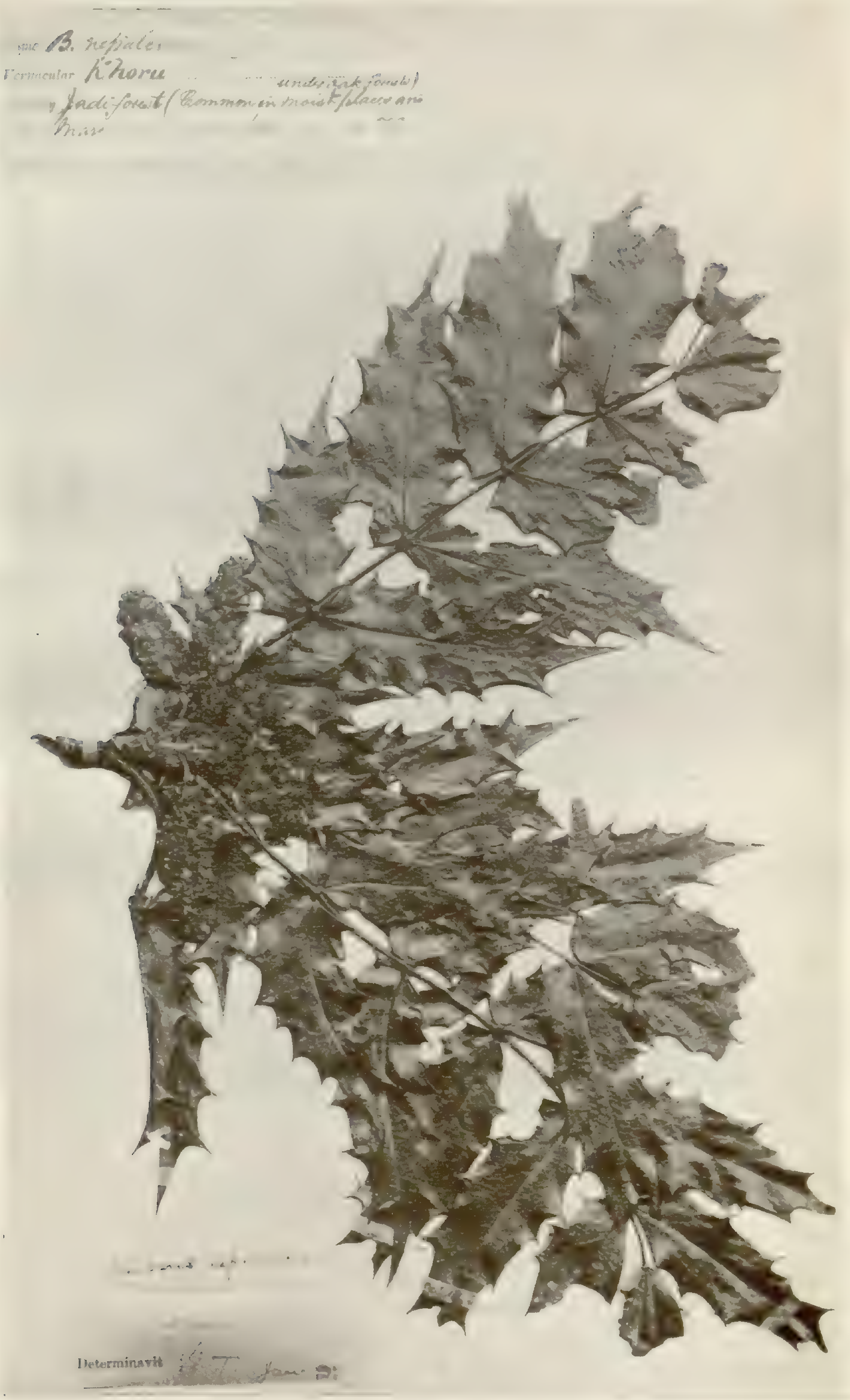
Mahonia Roxburghii, (DC.) Takeda.



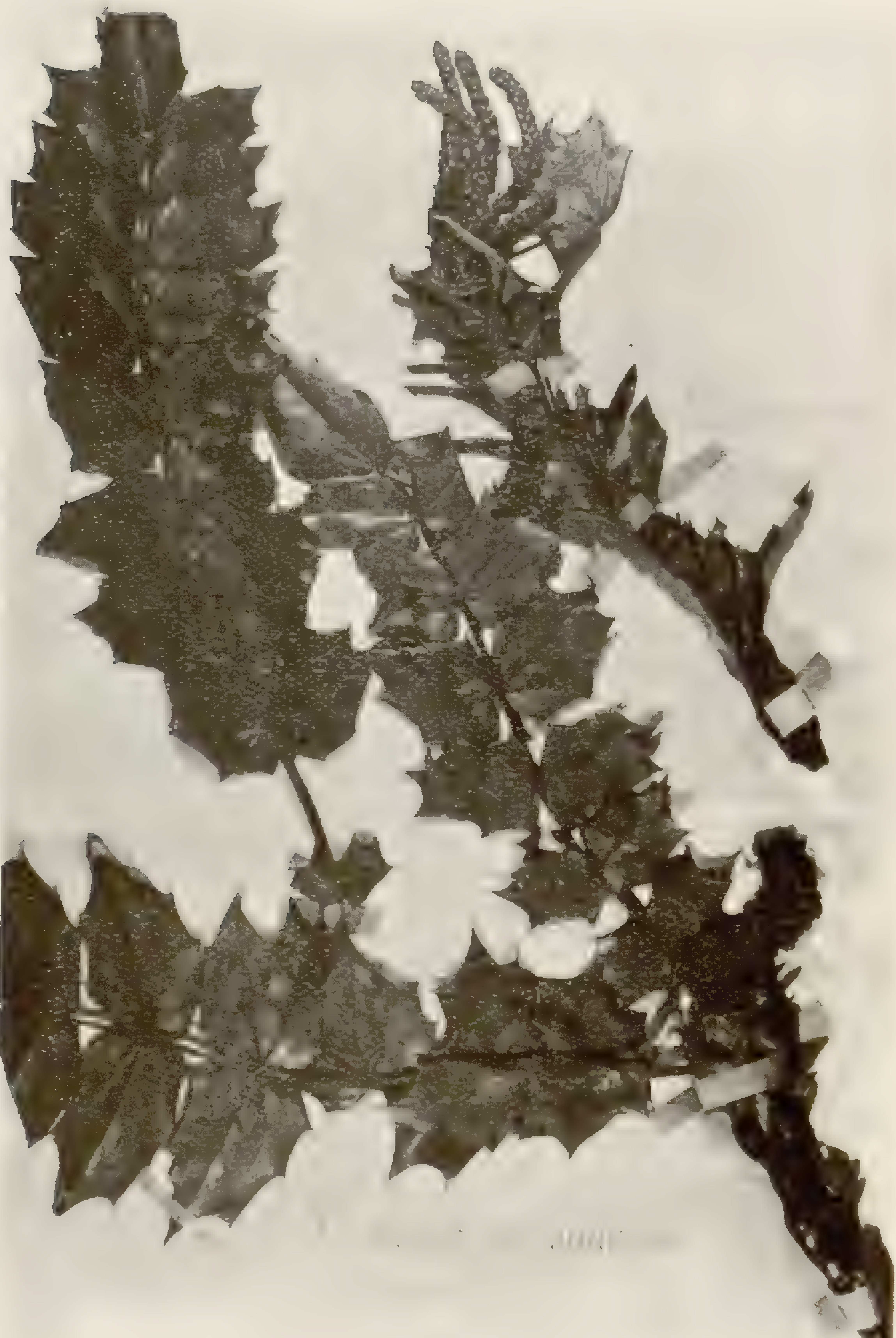
Mahonia acanthifolia, G. Don.


No Berberis nepalensis Spreng

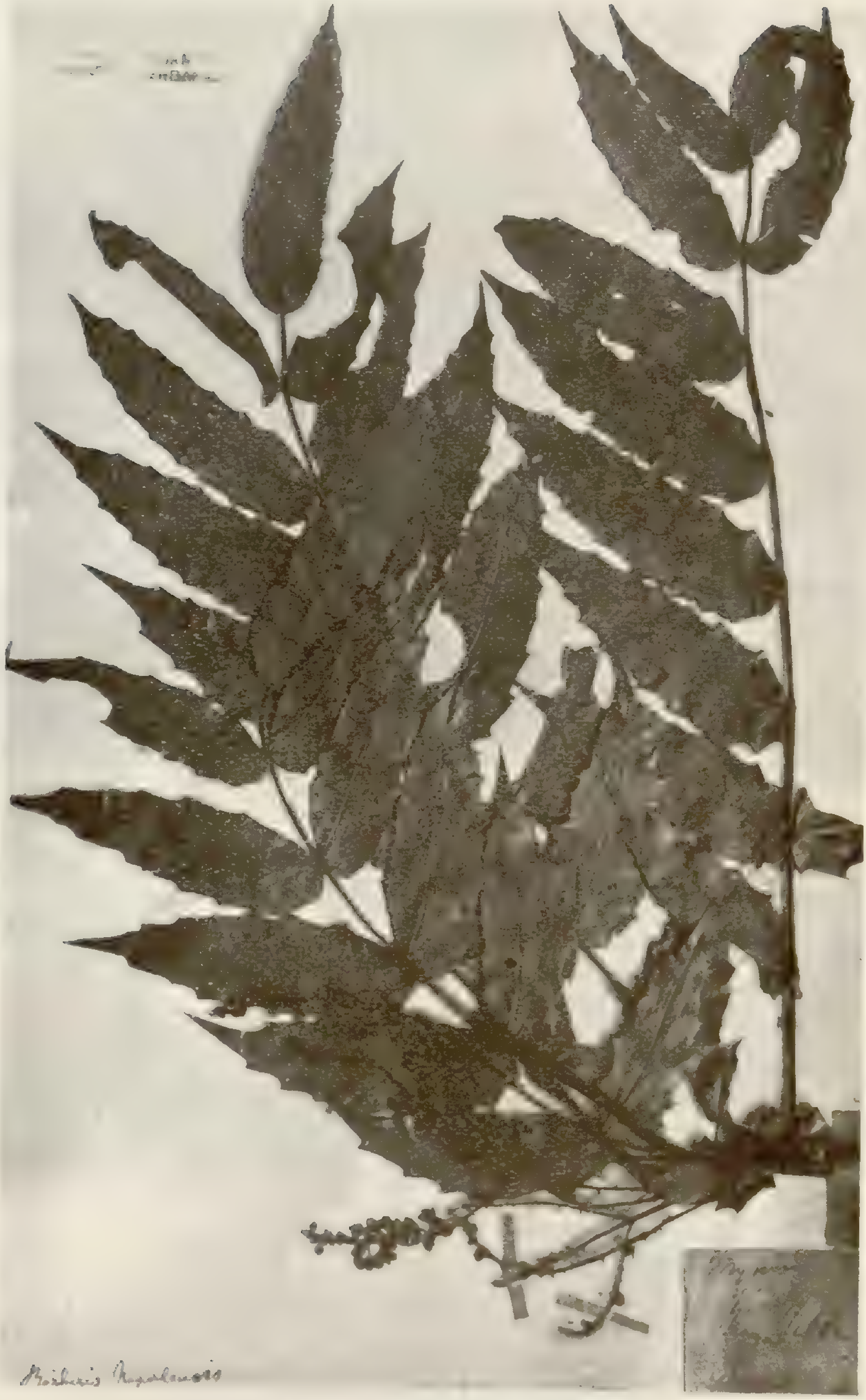
Mahonia sikkimensis, Takeda.


B. nepale
Vernacular Khoru
under oak forests)
Jadi forest (Common in moist places and
Mar
Determinavit
Jan 21

Mahonia borealis, Takeda.



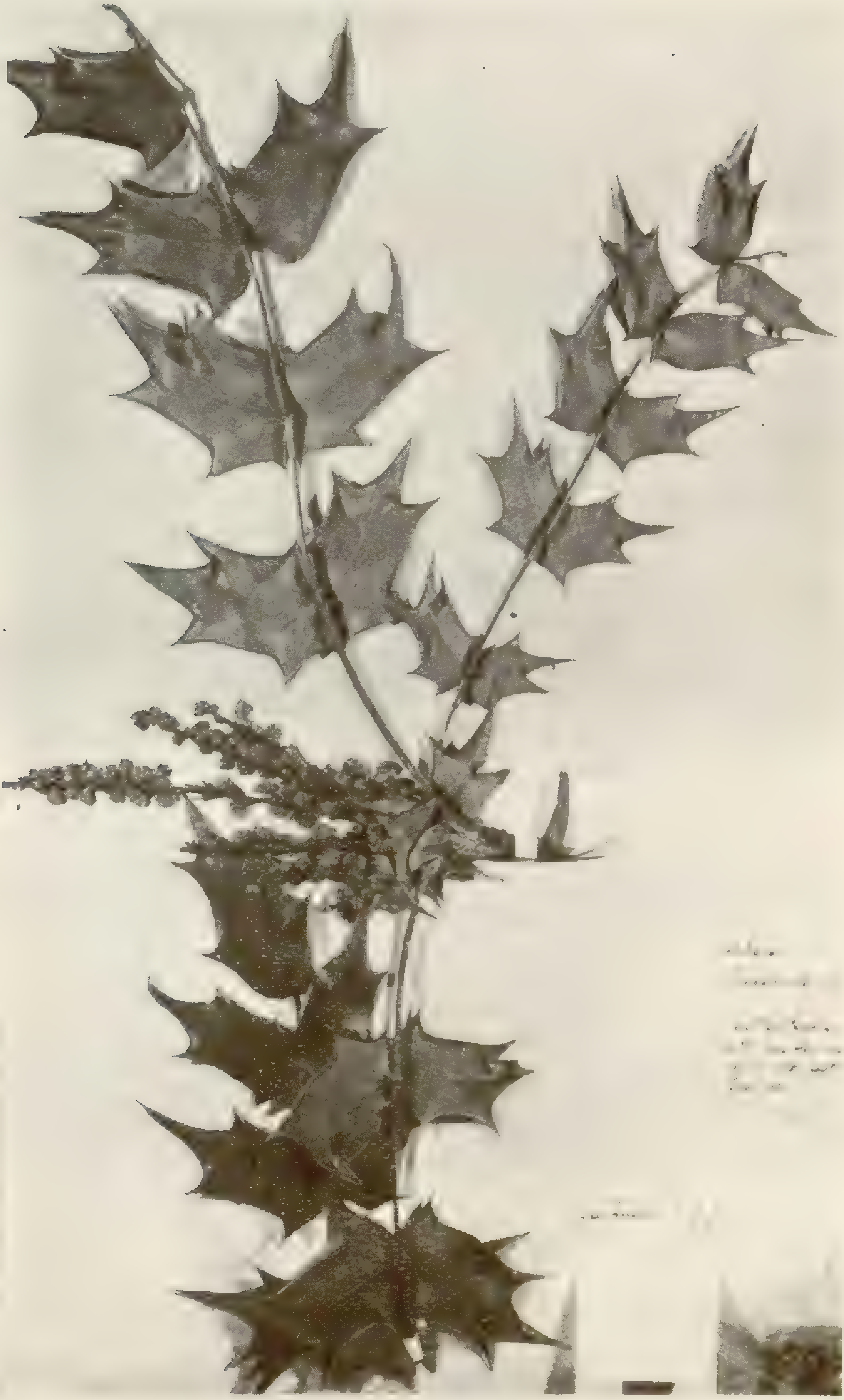
Mahonia manipurensis, Takeda.


Berberis Nepalensis

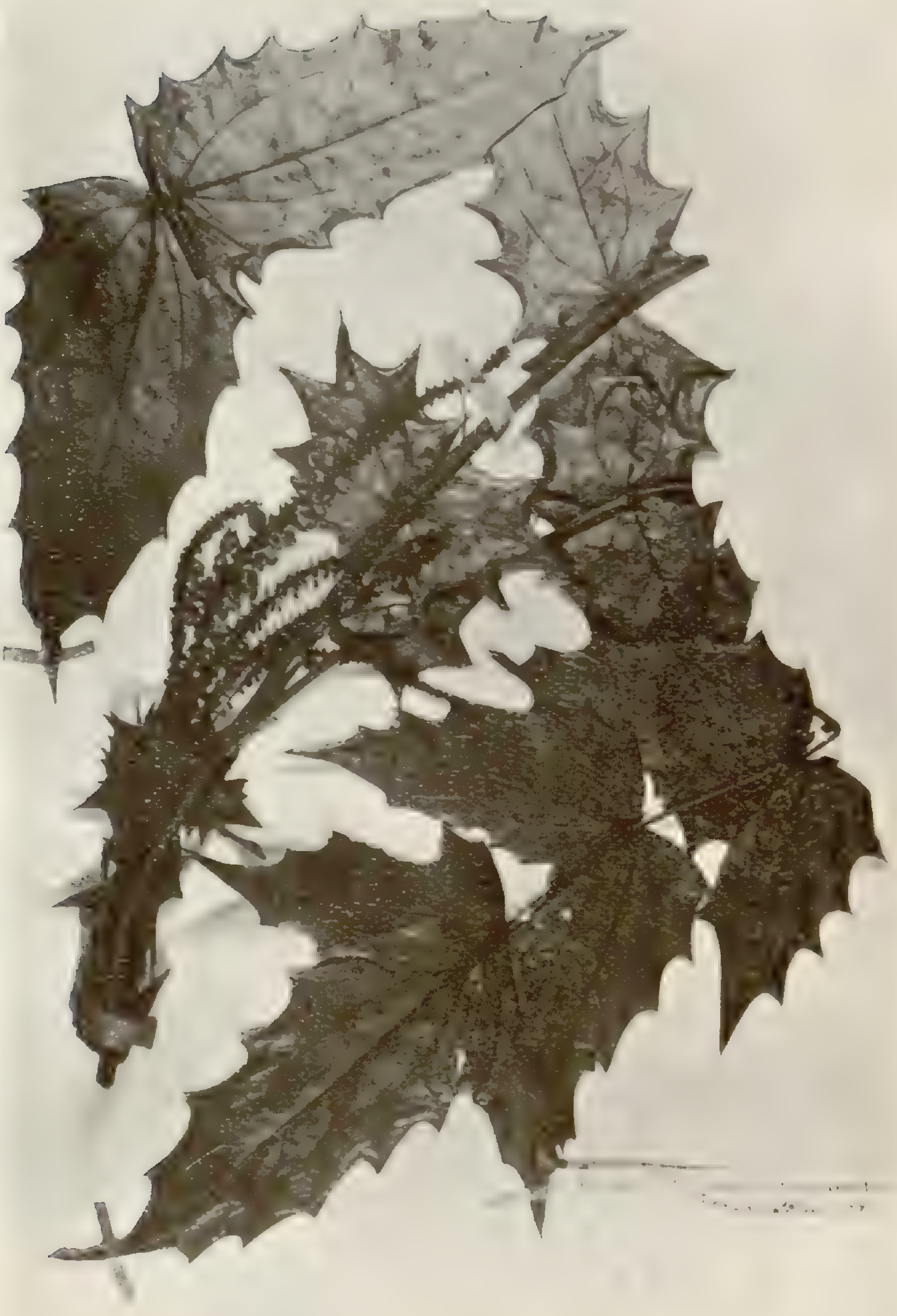
Mahonia Simonsii, Takeda.

Berberis
Leschenaultiana
Ex Indiæ Orientalis montibus *Nilgherry*.
Herb. Ball.
Comm. G. S. GOUGH.
Mahonia Leschenault:
Determinavit A. T. June 1914

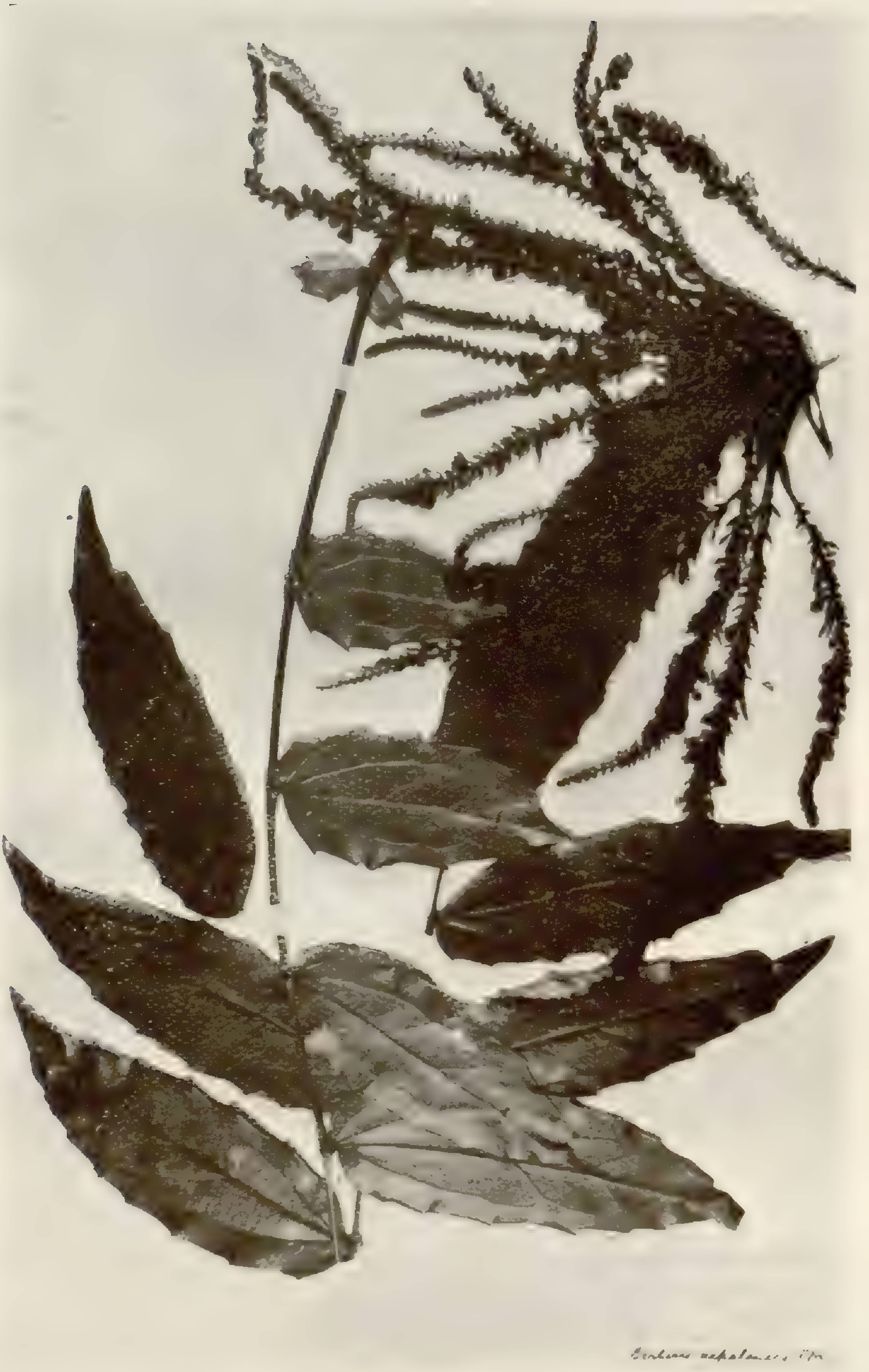
Mahonia Leschenaultii, (Wall.) Takeda.



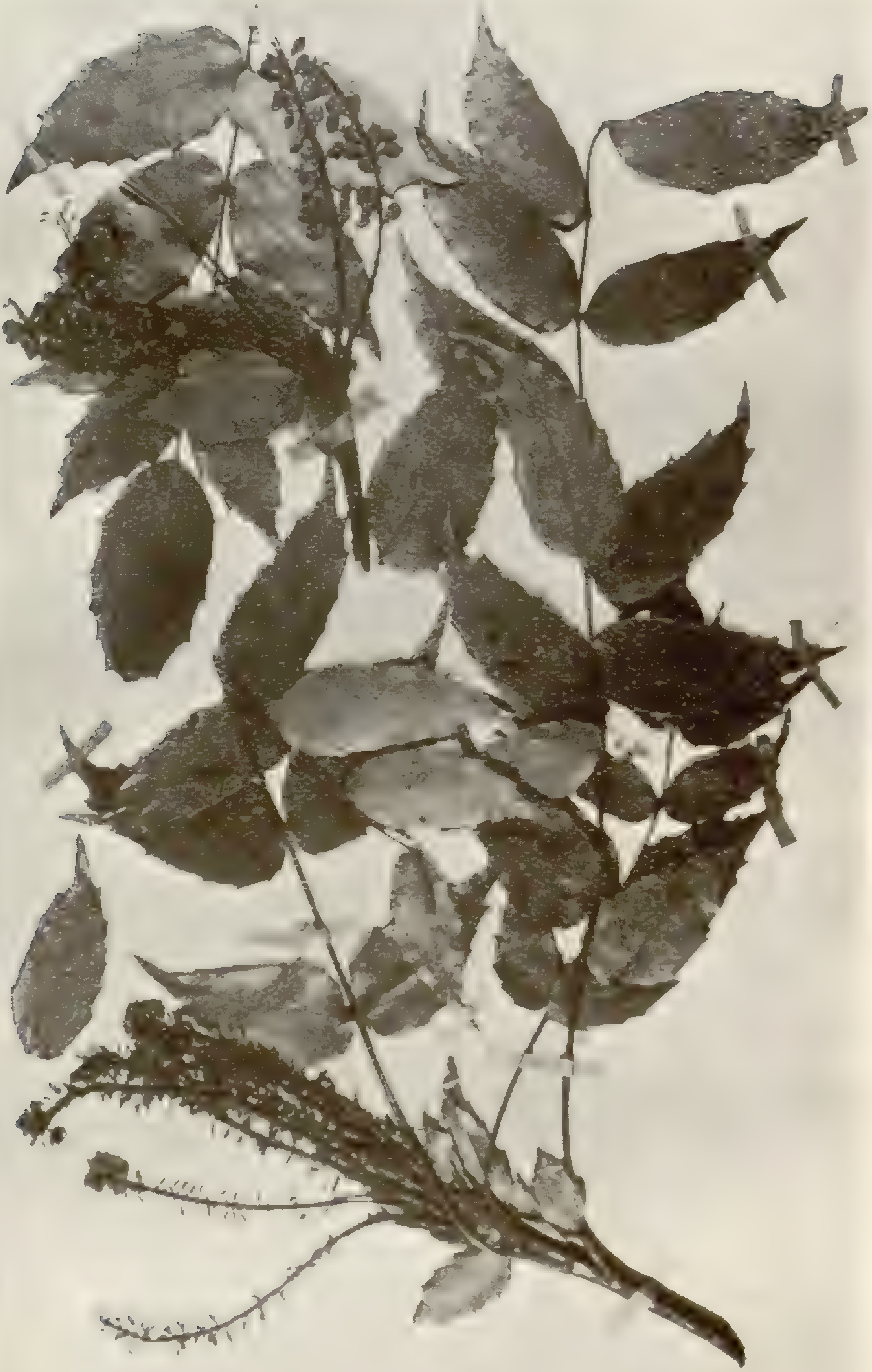
Mahonia Bealei, Carr.



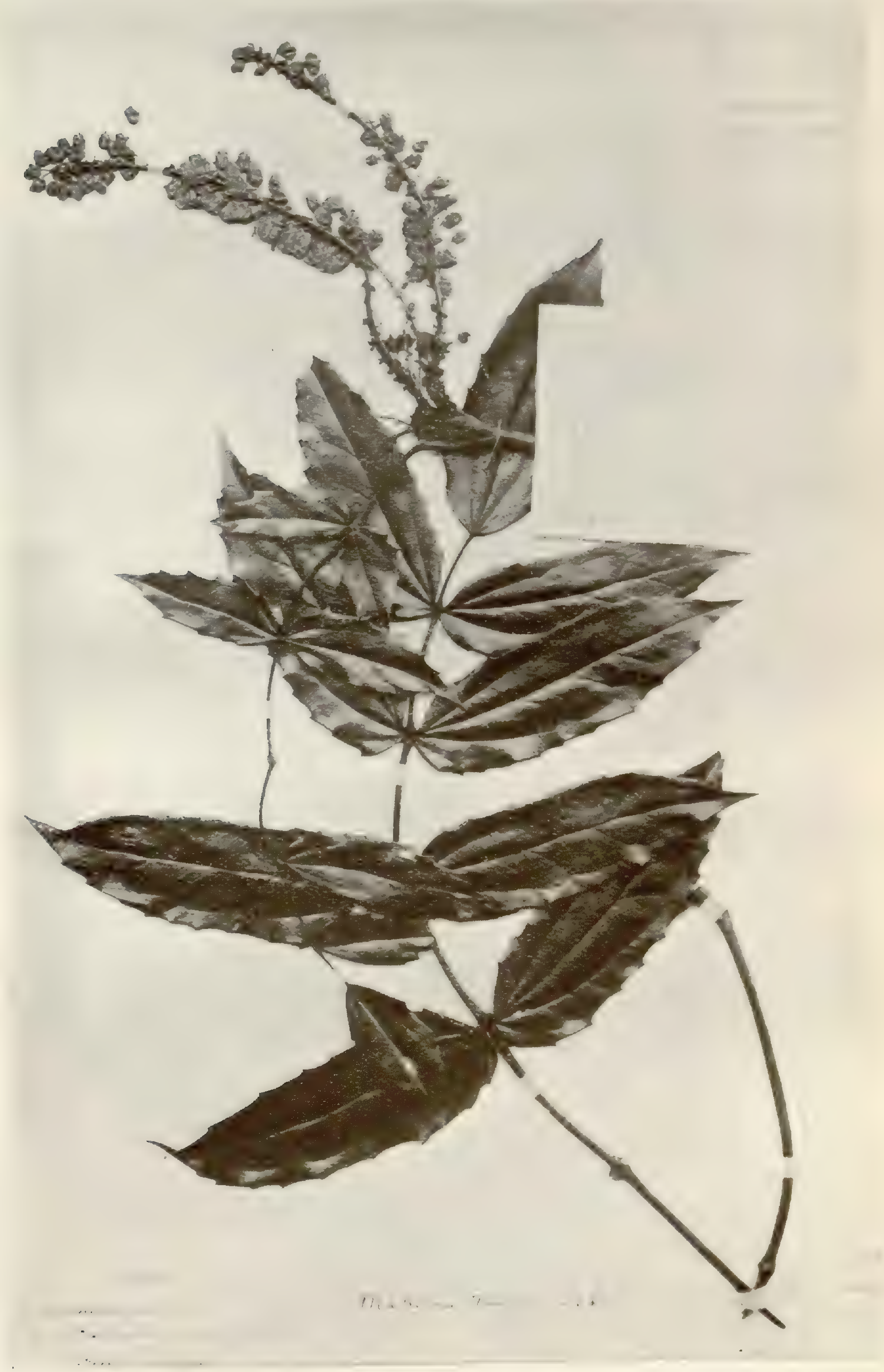
Mahonia Bealei, Carr.


Berberis nepalensis, Spr.

Mahonia flavida, Schn.



Mahonia Fordii, Schn.

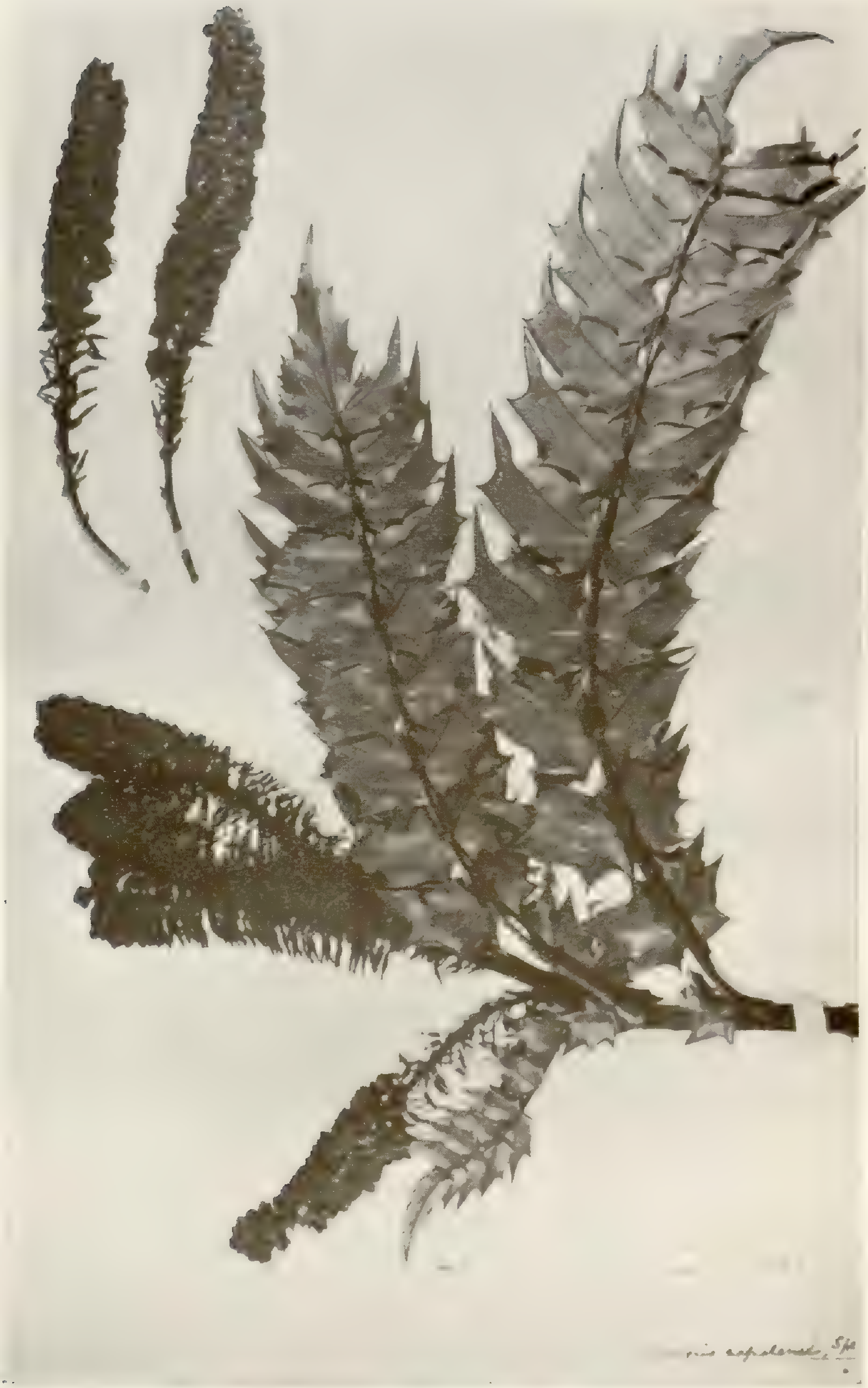


Mahonia Mairei, Takeda.

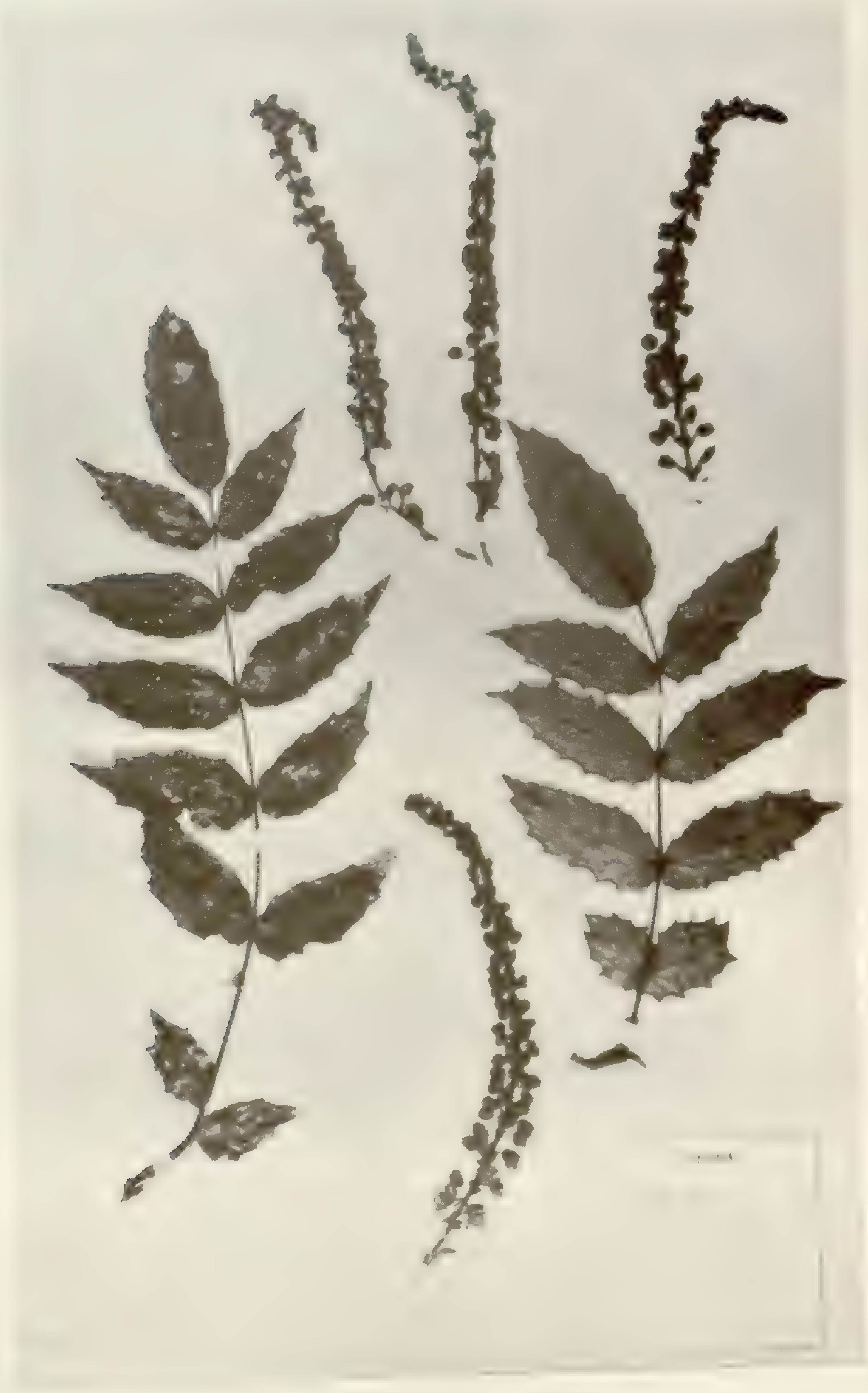
YUNNAN. WEST

Mahonia bracteolata, Takeda.

Mahonia dolichostylis, Takeda.



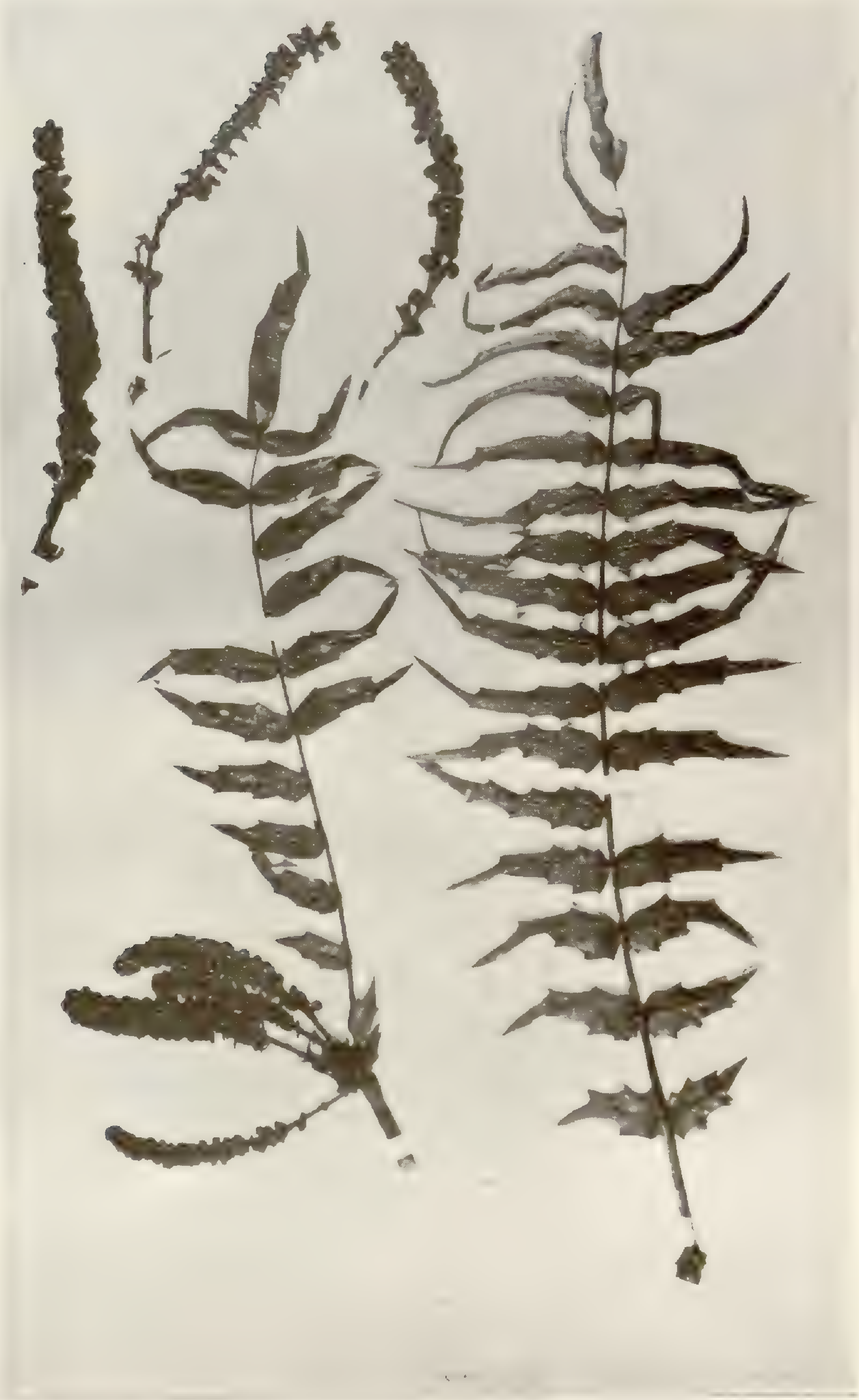
Mahonia conferta, Takeda.



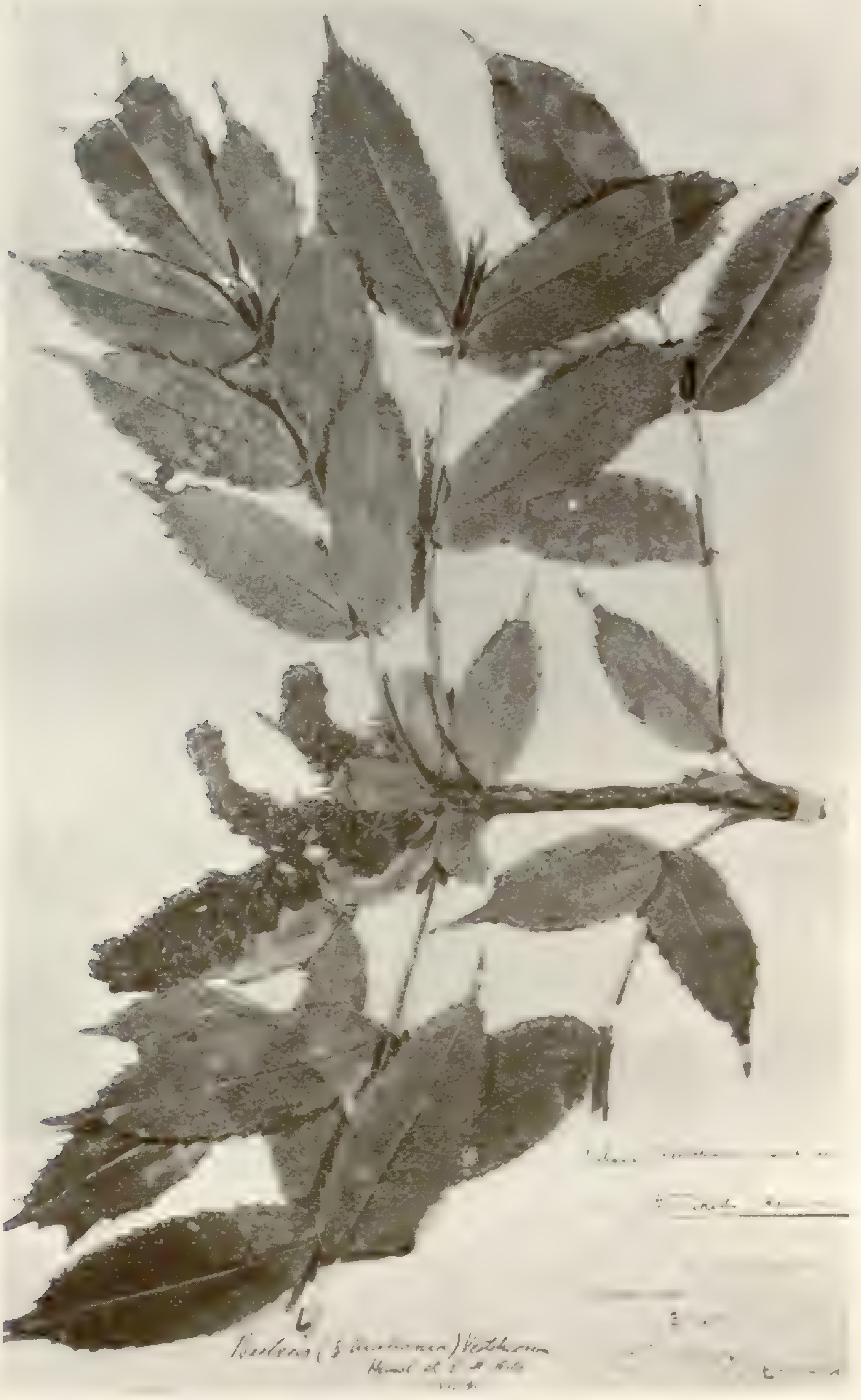
Mahonia Hancockiana, Takeda.

Determinavit
F. 141

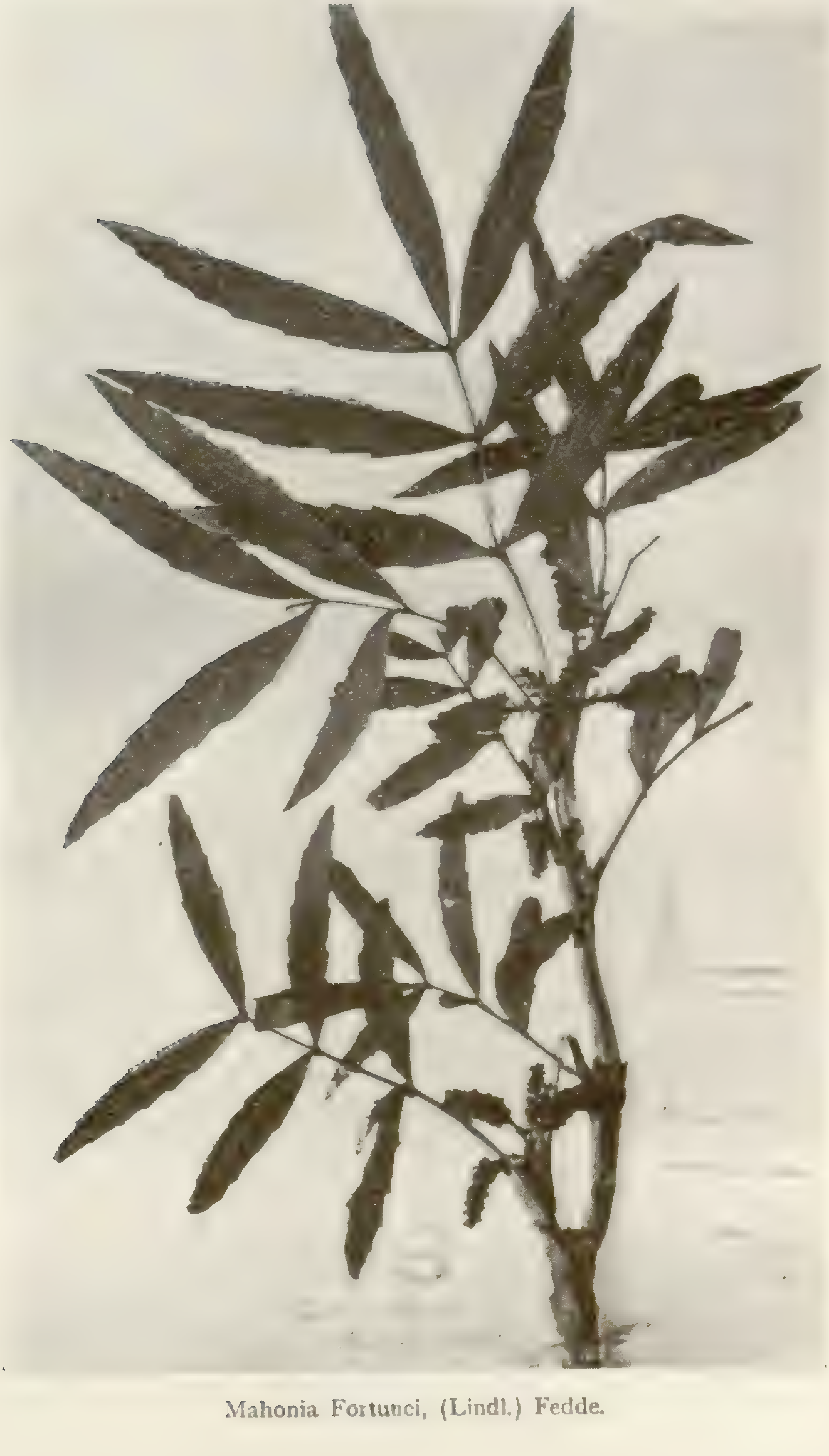
Mahonia lomariifolia, Takeda.



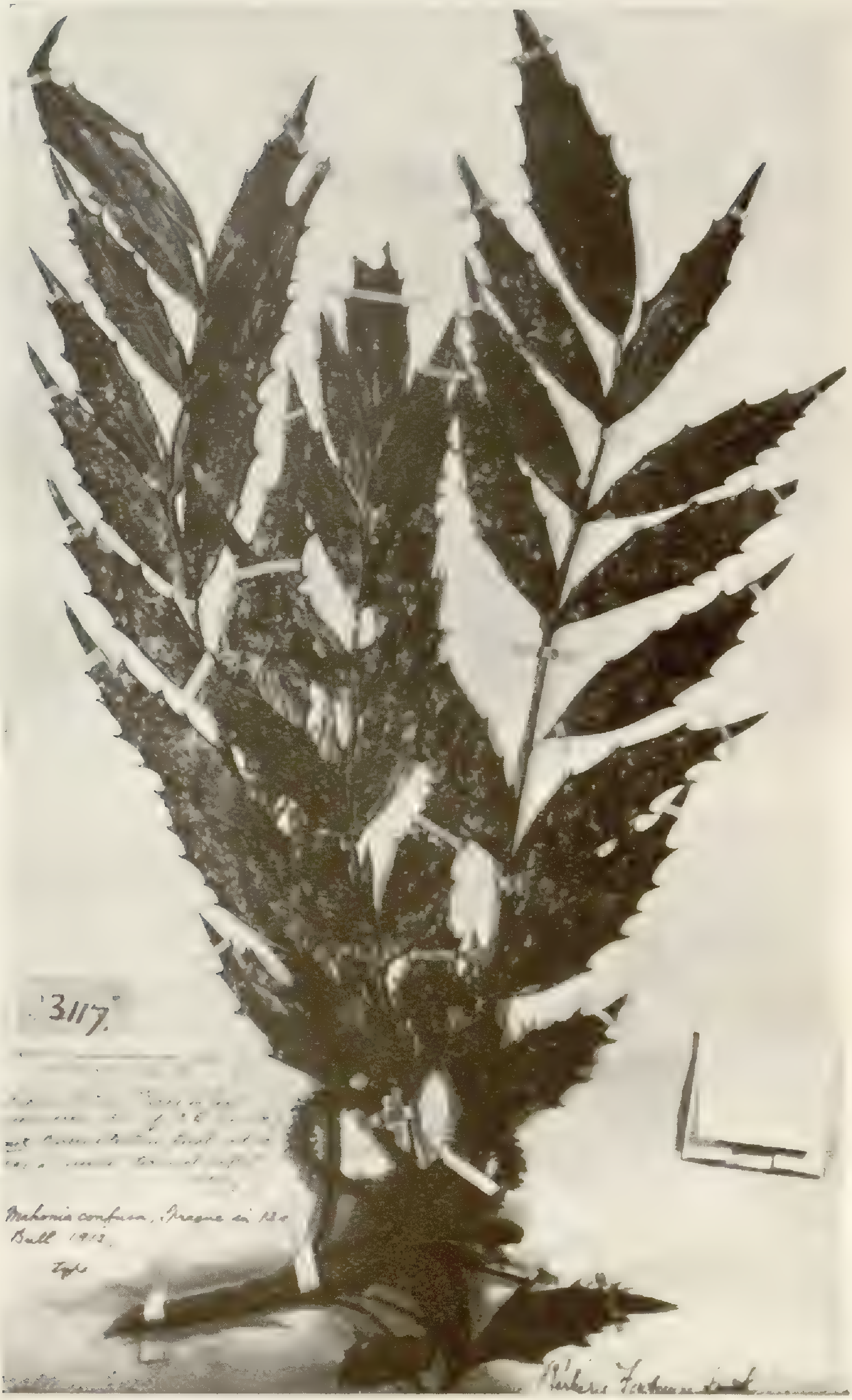
Mahonia lomariifolia, Takeda.



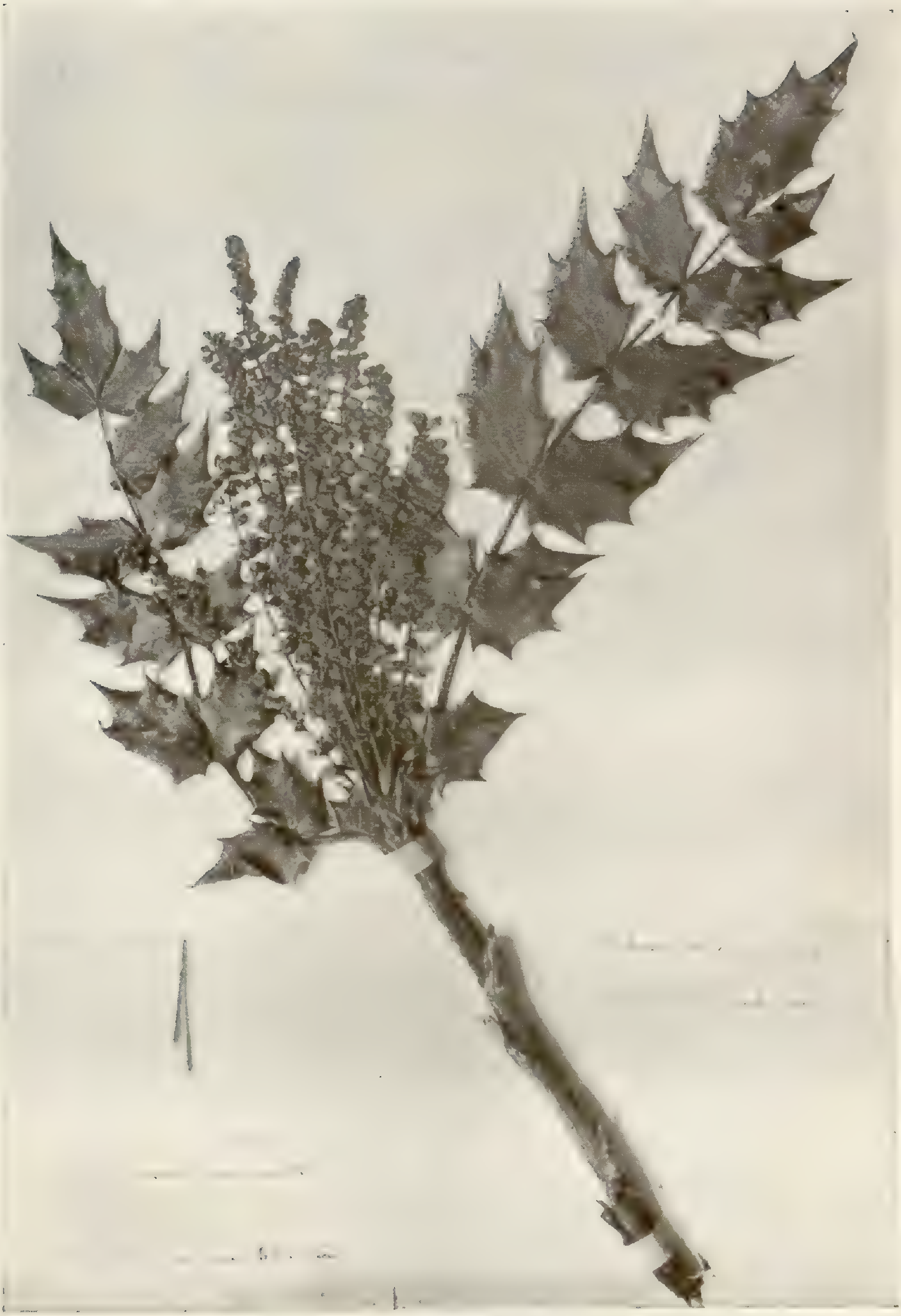
Mahonia Veitchiorum, (Hemsl. et Wils.) Schn.



Mahonia Fortunei, (Lindl.) Fedde.

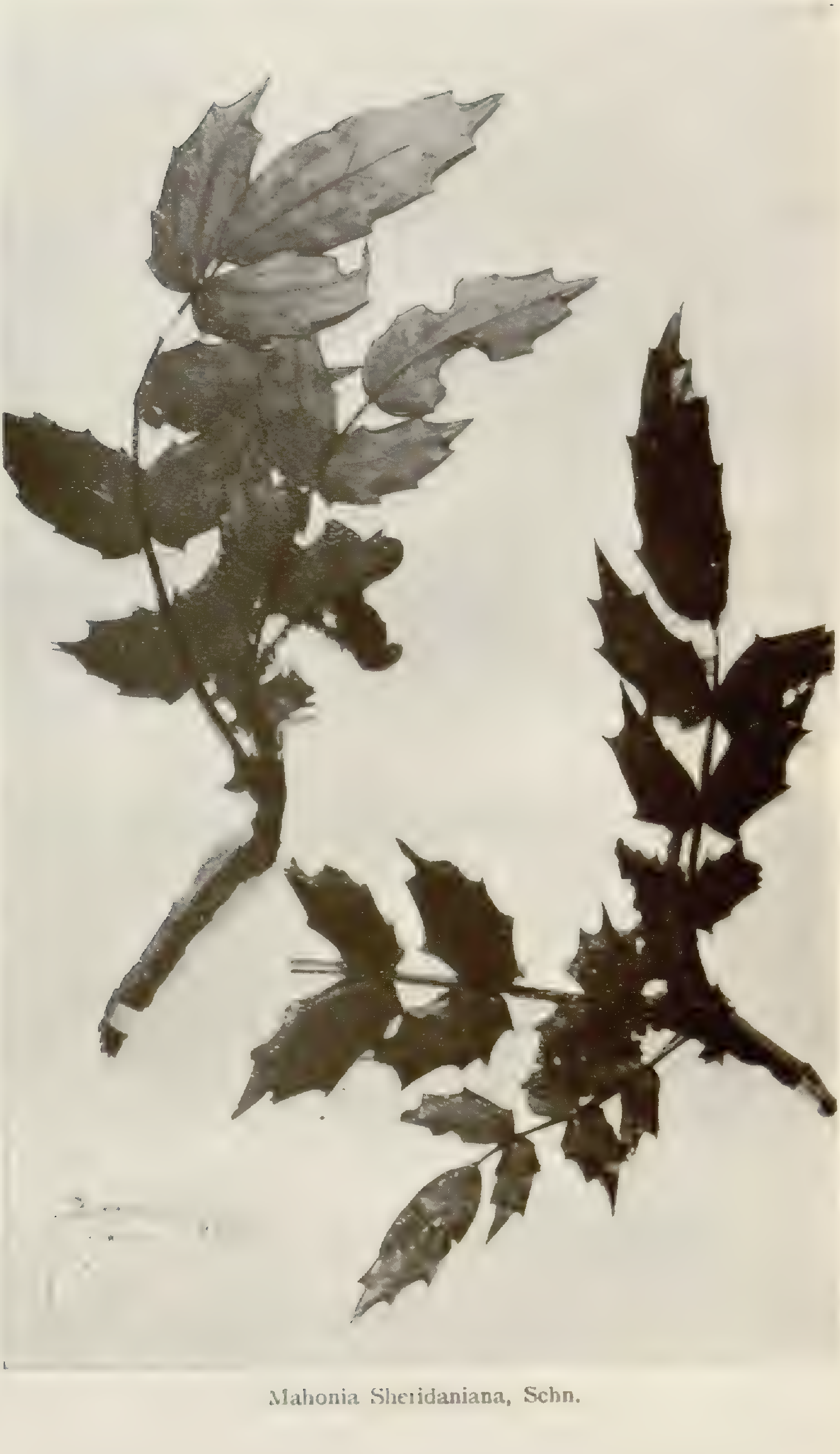

3117
Mahonia confusa, Sprague in Kew Bull 1913.
Type

Mahonia confusa, Sprague.

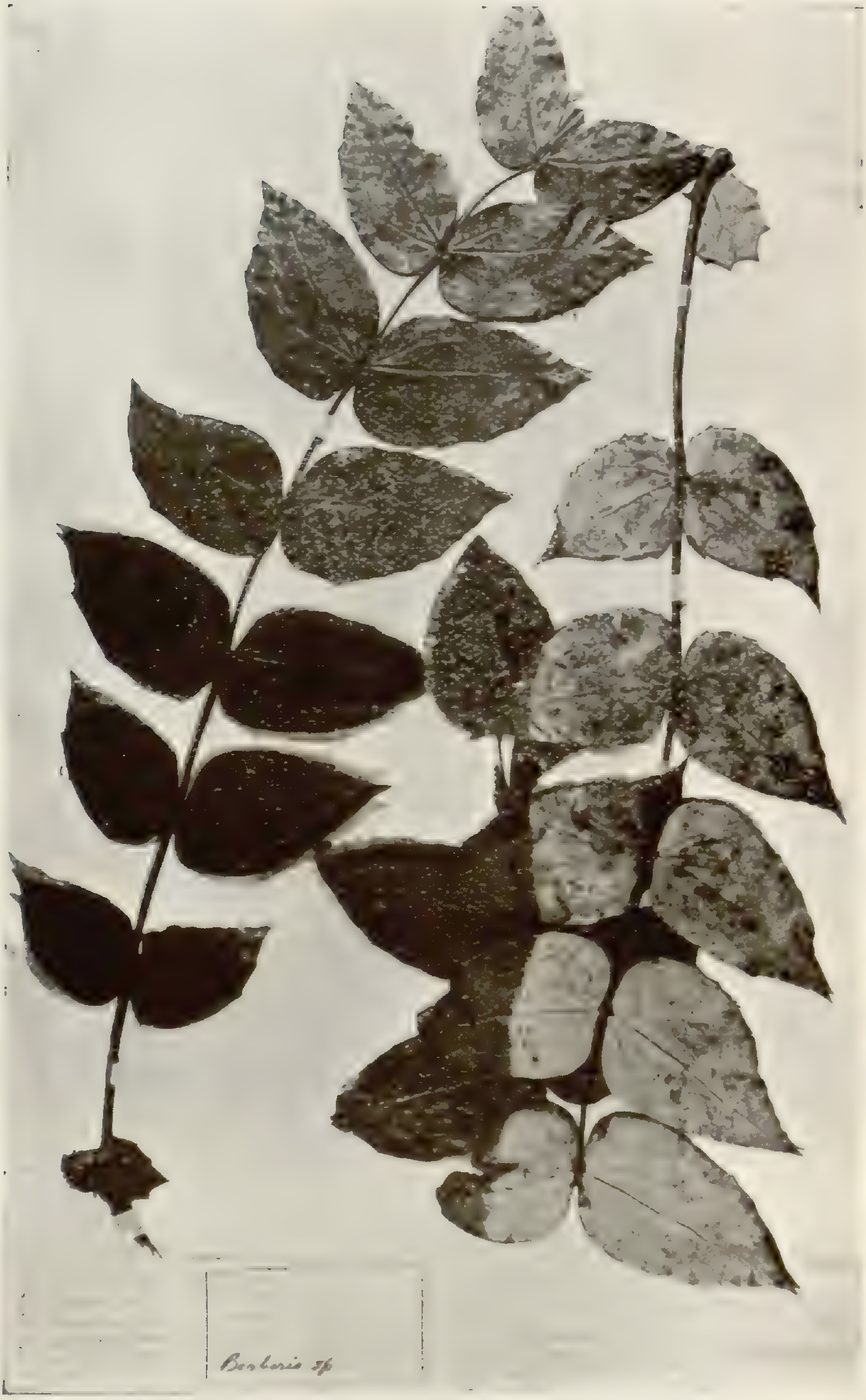


Mahonia Fargesii, Takeda.

Mahonia longibracteata, Takeda.



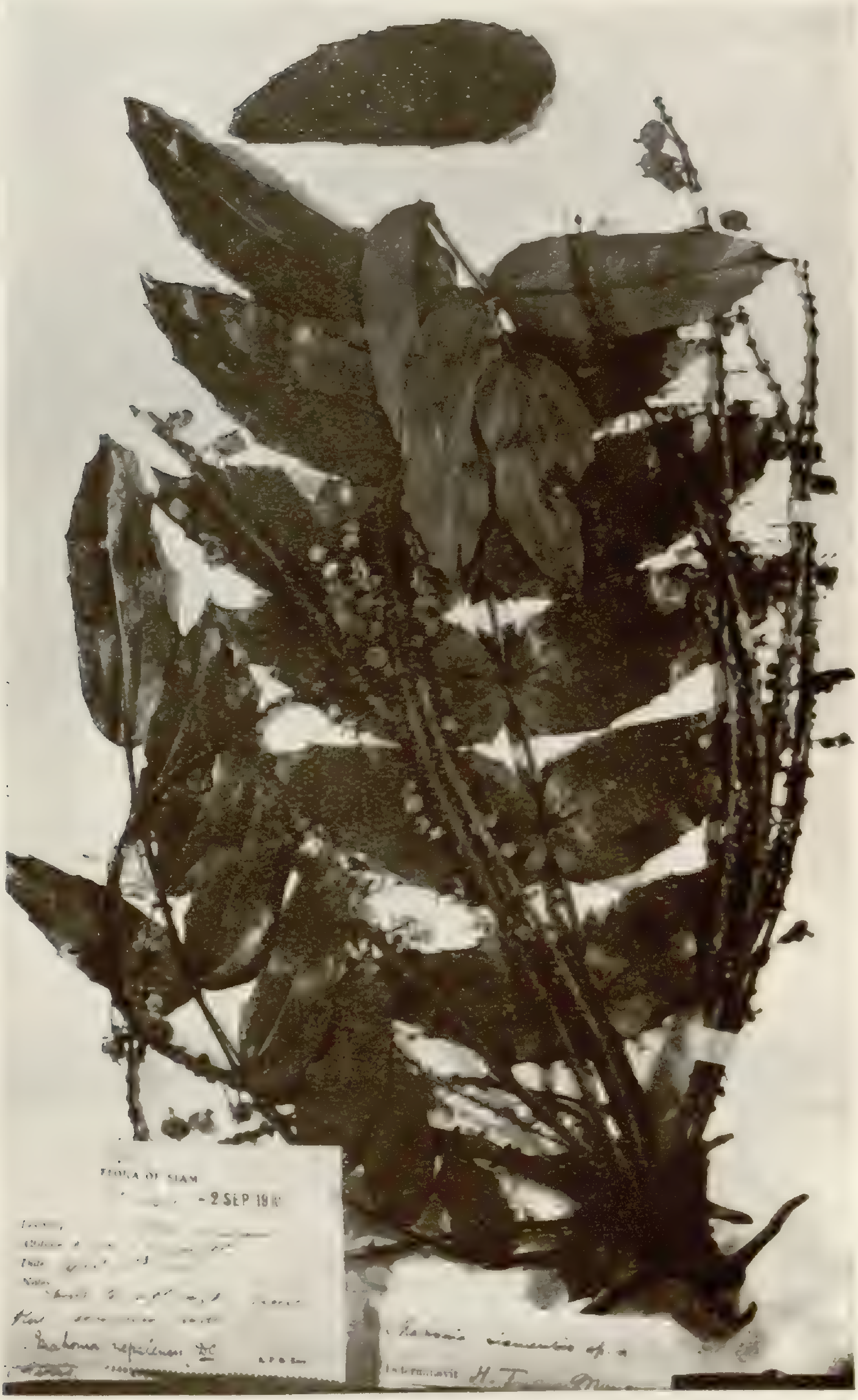
Mahonia Sheridaniana, Schn.


Berberis sp

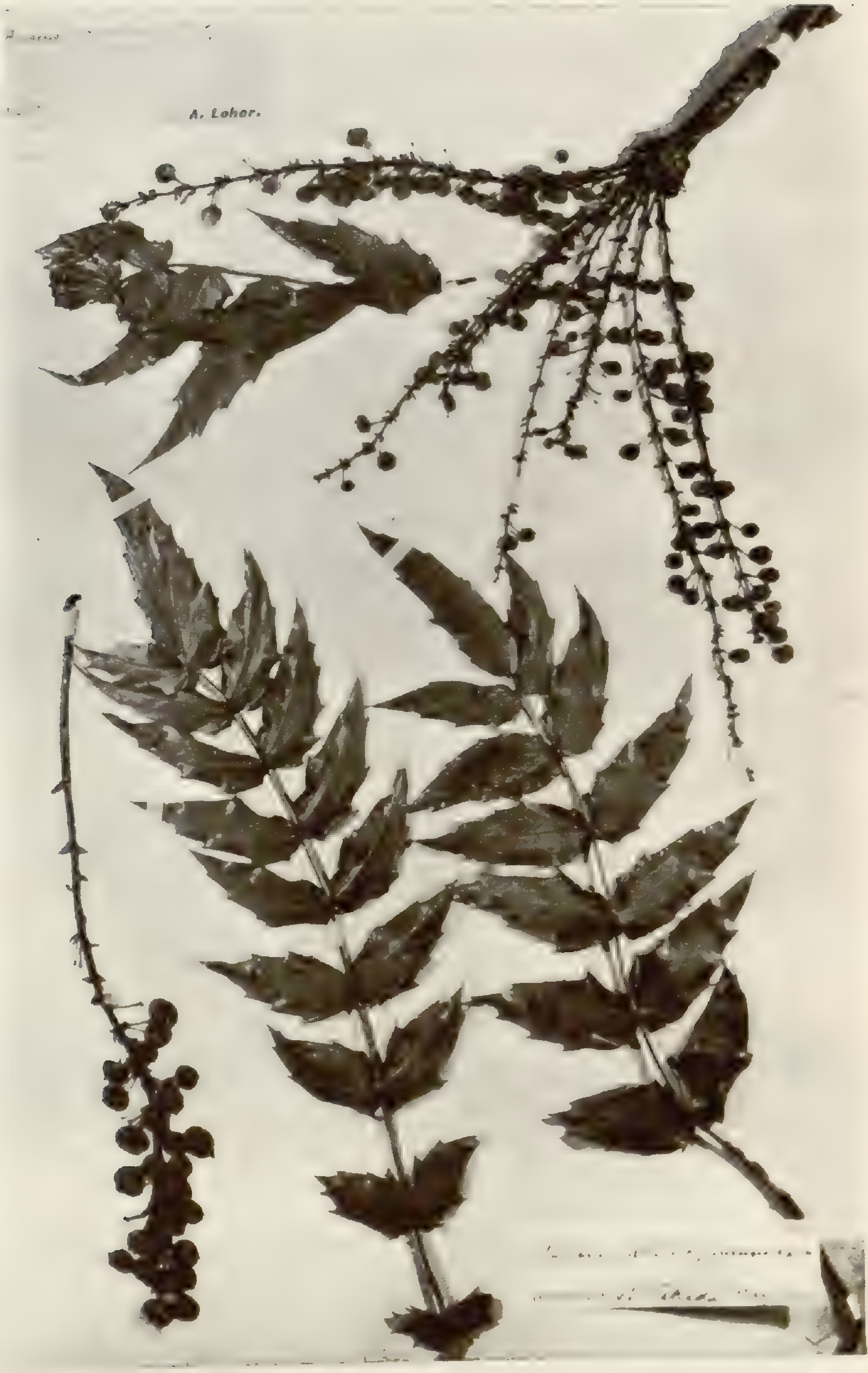
Mahonia hypoleuca, Takeda.

PLATE XXX.

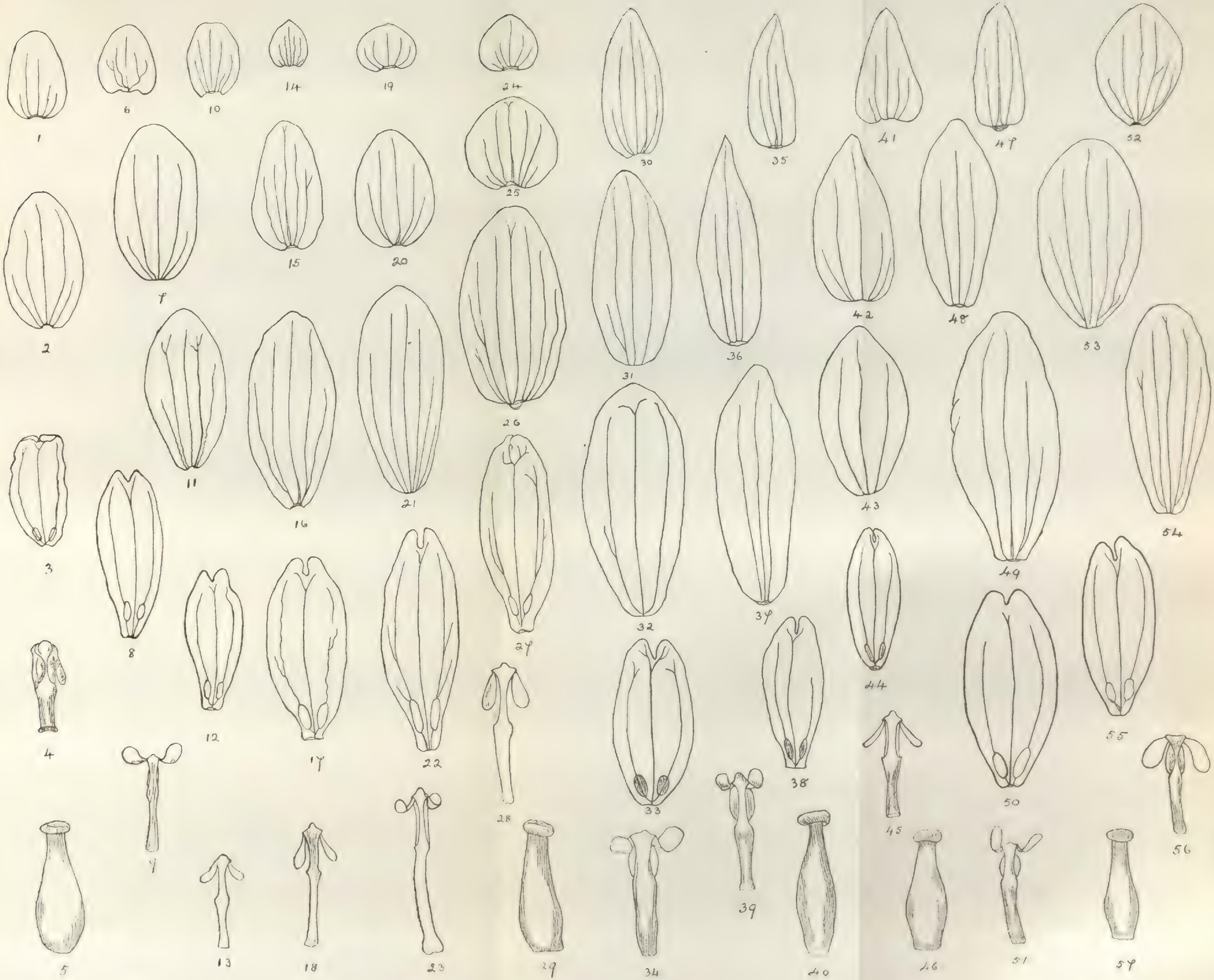
Mahonia japonica, (Thunb.) DC.

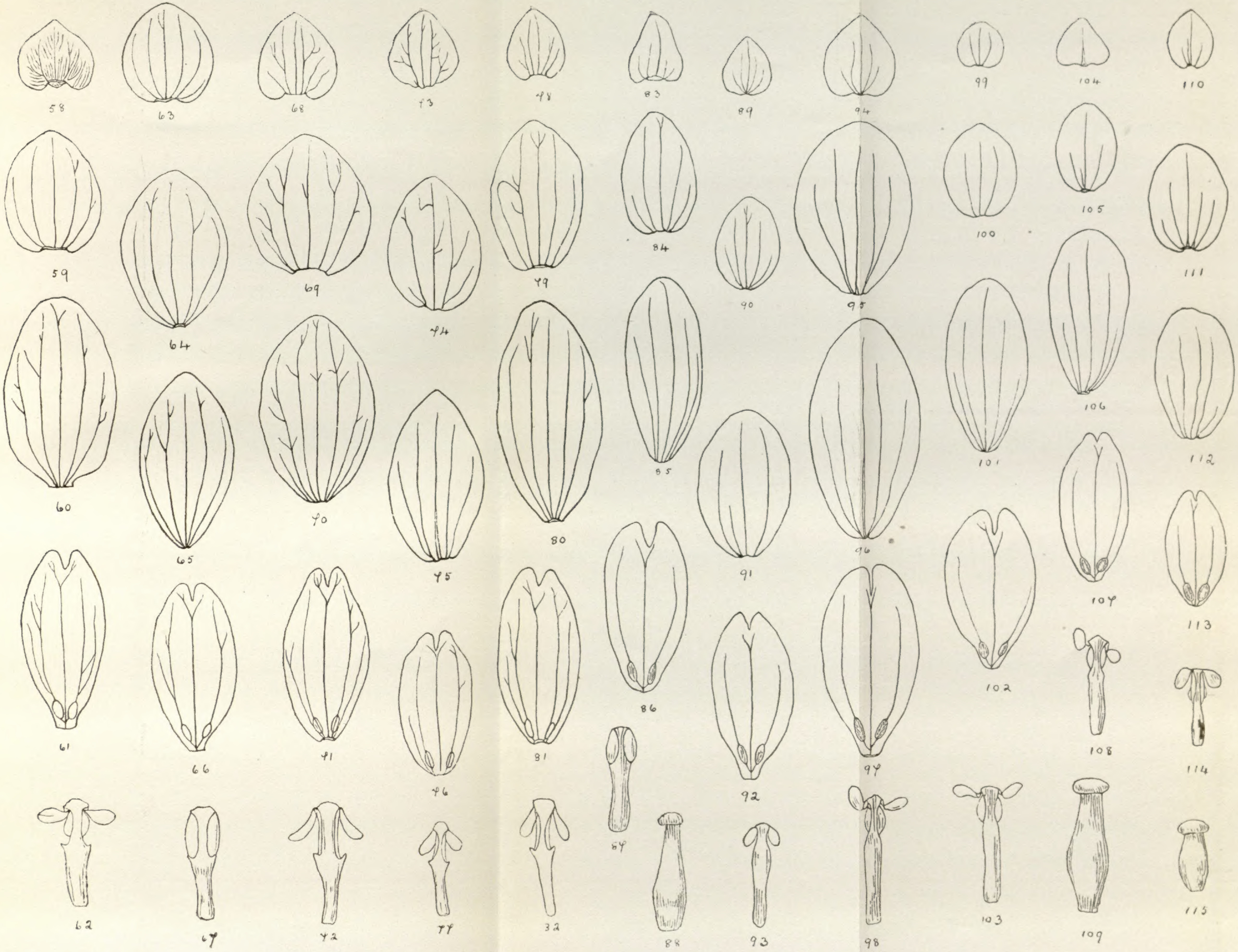

FLORA OF SIAM
-2 SEP 19

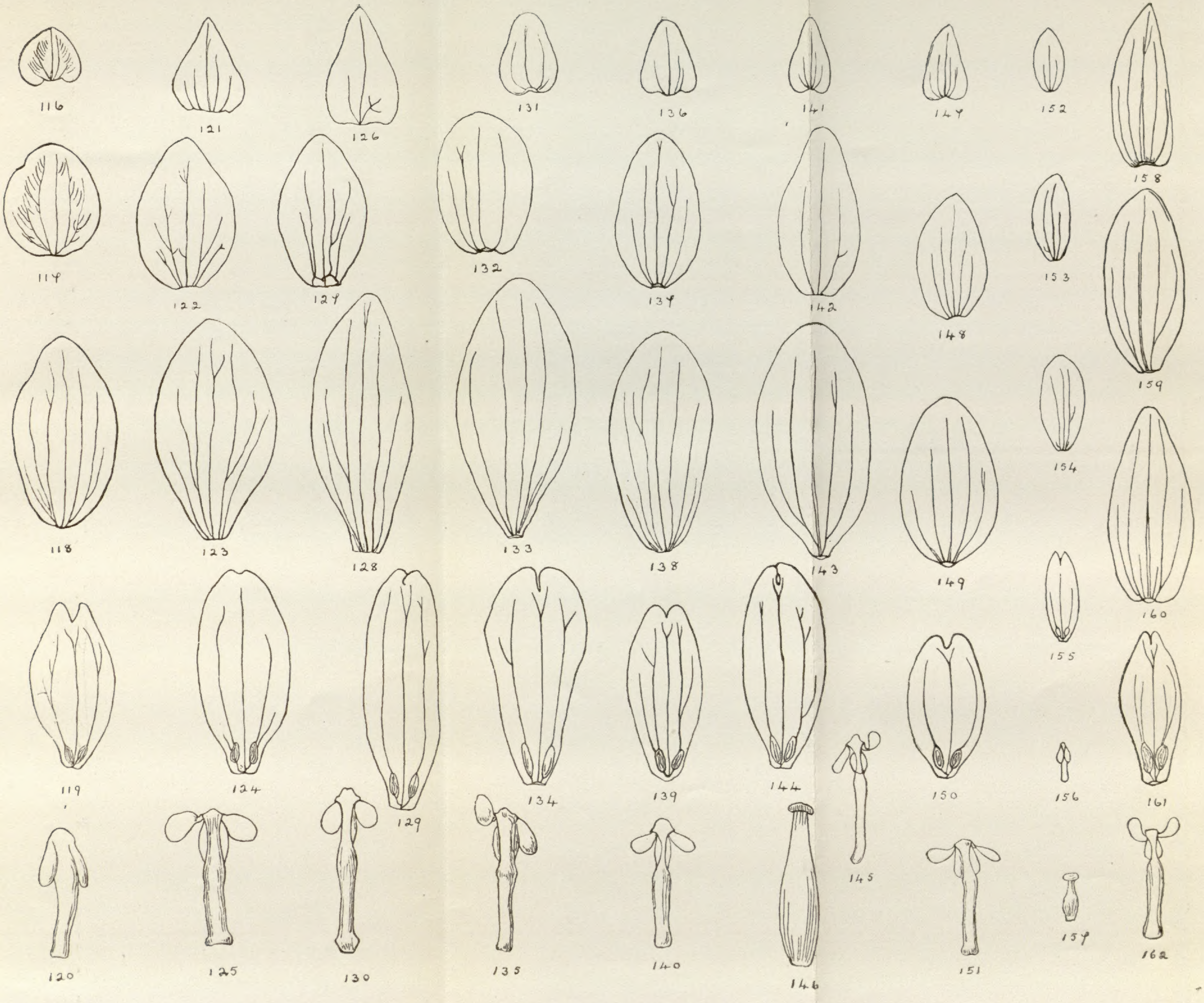
Mahonia siamensis, Takeda.

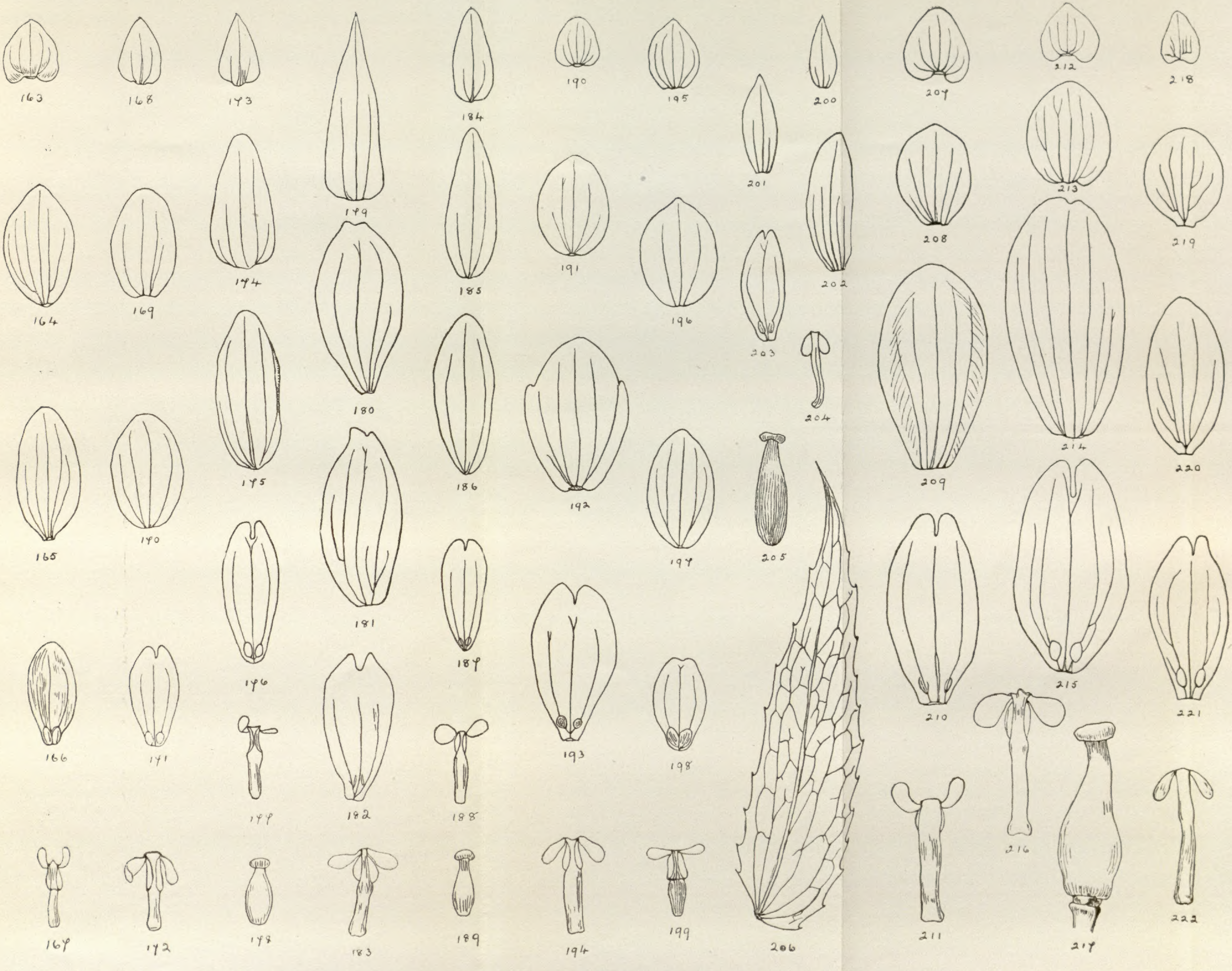


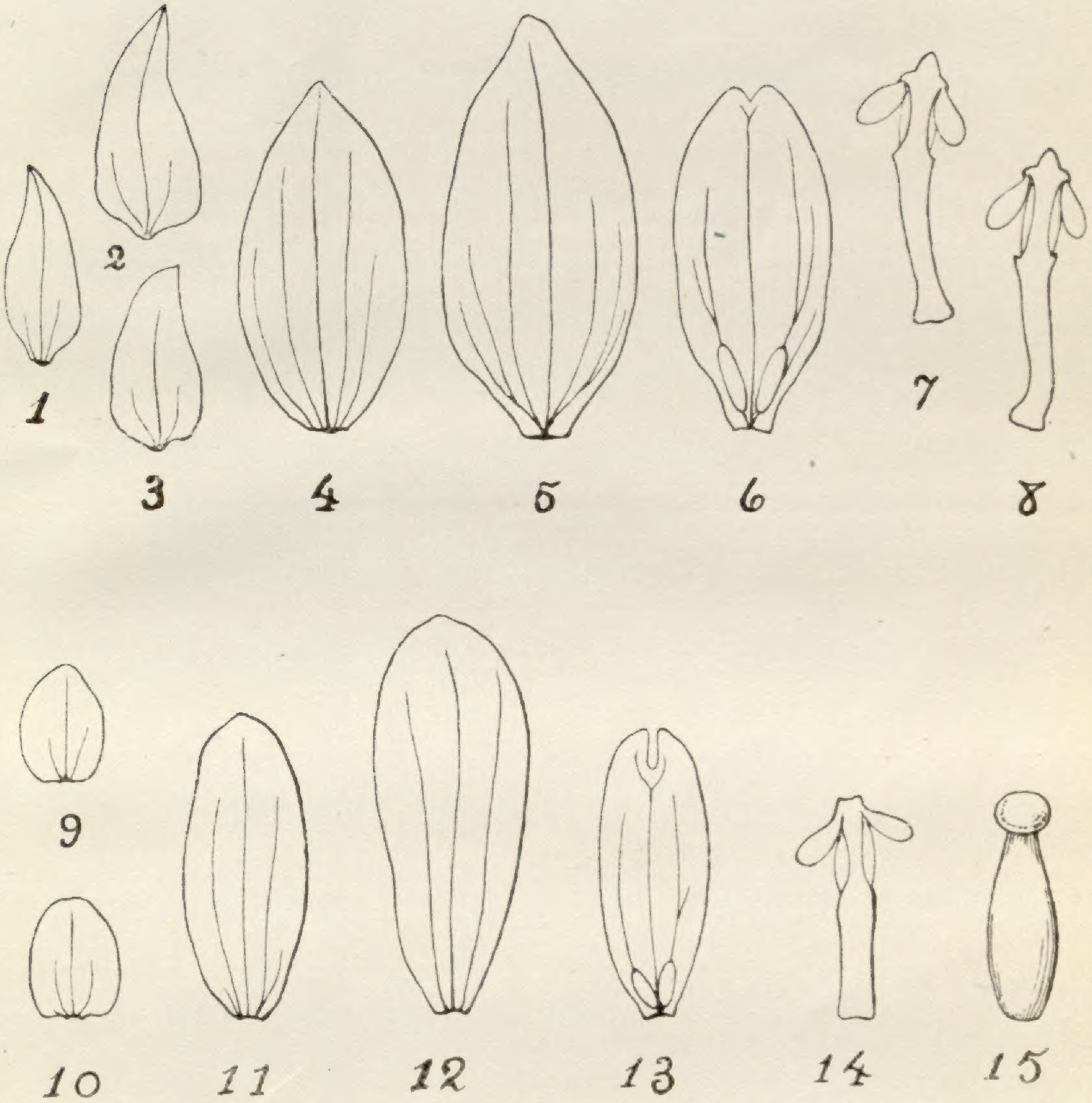
Mahonia philippinensis, Takeda.











Figs. 1–8.—Mahonia sikkimensis, Tak., × 6. Figs. 1–3, outermost sepals. Fig. 4, middle sepal. Fig. 5, innermost sepal. Fig. 6, petal. Figs. 7–8, stamens.

Figs 9–15.—Mahonia Simonsii, Tak., × 6. Figs. 9–10, outermost sepals. Fig. 11, middle sepal. Fig. 12, innermost sepal. Fig. 13, petal. Fig. 14, stamen. Fig. 15, pistil.